Exhibit A

PERMIT
68-30

October 2?, 1968

1968
(CR-AGG)

Mrs. K. Marazzo

Mr. James K. Rankin

Project No. 32.01:420-451-655; Raritan Bay - Sandy Hook Bay Cooperative Hurricane and Shore Protection Project; Madison Township - Permit 68-30; Sea Land Development Corp.

Your file with notation dated September 9, 1968 requesting report on meeting held September 6, 1968 with Sea Land Development is attached.

Representation at the September 6, 1968 meeting was:

State: Messrs. Rankin, Marron, Kelly, Johnson.
Township: Township Engineer John Allgair
Sea Land: President J. A. Tajounis, Attorney A. S. Klefner

With reference to attached map dated September 11, 1968, the Sea Land case is summarized:

1. Sea Land purchased the upland area colored "Green" from Wilson Avenue east to Margaret Creek.

2. Sea Land proposes to purchase a riparian grant for the combined "Red" and "Red hatched" area in order to have a total land area (upland plus riparian) of 17 acres to meet local zoning requirements.

3. Sea Land proposes to build a seawall composed of slag and clay core with stone revetment on outshore side and berm. The heavy black line shows the seawall location from Wilson Avenue east to Margarets Creek. The seawall berm is to be 15' above mean sea level and Sea Land is to fill behind it to same elevation. The seawall would substitute for the protective feature of the beachfill placed at this

location by the Army Engineers.

4. If the State conveyed its ownership of the riparian lands marked "Red" and "Red hatched", the title in fee would go to Sea Land, but the grant would reserve to the State an easement in perpetuity for public use of the "Red Hatched" area which would satisfy the public recreation benefits requirement of the federal beachfill project.

5. Sea Land has been advised that the State would also require beachfill placement in front of the seawall so as to establish a beach in fact. Sea Land has agreed to this subject to final accord upon establishment of the cost to the Corporation.

6. Sea Land has been advised that all discussions are at staff level for the purpose of reporting to higher authority for decision.

7. Sea Land has been asked to furnish survey data as the map attached is incomplete and has been advised that work-up of the riparian data cannot be made until such information is submitted.

In addition to the general outline of the case as noted above, the following specific items were noted at the September 6,1963 meeting.

1. Sea Land was to fix the exterior grant line it needs to assemble 17 acres and submit for review. (This is shown on the attached map). Mr. Tsigounis said that the seawall location was fixed and would furnish bearings, distances and ties. Sea Land, also, would furnish other necessary survey information required for riparian investigation. This would include former riparian grant shown at west end of frontage which state finds incorrectly located and in fact outside the frontage under consideration.

October 13, 1966

Mrs. A. Marazzo

Sea Land has indicated a willingness to convey its interest in this former grant to the State in order to remove any future question. This is being investigated.

2. Mr. Tsiounis stated that Sea Land was willing to place a beachfill outshore of the seawall for public recreational use, but the cost based on his information was a considerable item and he asked that the beachfill dimensions be reviewed. He was advised that this would be done.

3. It was emphasized that further advance in this case would depend on receipt of the survey information from the Sea Land Engineers.

JKR:ms
attachment

James K. Kenellin
Acting Chief
Navigation Bureau

cc: Mr. A. Scoppetuolo
Mr. F. Kelly
Mr. J. P. Marron
Mr. H. W. Bond

Exhibit B

MEMORANDUM

DATE May 20, 1970

TO: Director K. H. Creveling

FROM: Mr. James K. Rankin

SUBJECT: 68-131: Sea Land Development Corp; Riparian Grant, Raritan Bay, Madison Township

32.01:420-156-855 Madison Township CoOperative Hurricane and Shore Protection Project (1970)

68-131: On December 17, 1969, Council approved riparian grant to Sea Land with four conditions.

1. Applicant to deed back its title to that portion of the grant dated December 18, 1922 covered by its deed.

2. Applicant to convey a perpetual easement for a beach area of 2.808 acres of grant to be conveyed.

3. Applicant to create a beach acceptable to the U. S. Army Corps of Engineers to replace one constructed under its coast protection project.

4. Applicant to provide public access over its property to proposed beach area.

Meeting was held May 19, 1970 at New York District Office, Corps of Engineers to obtain Corps views on Conditions Nos. 3 and 4. Those present were Mr. Panuzio and Mr. Nersesian of the Corps and Mr. Wicker and Mr. Rankin of Navigation Bureau. The results of the meeting are as follows:

Condition No. 3: Beachfill

1. The new beach to be constructed outshore of the Sea-Land Seawall shall be equal in design to the Cooperative Project beachfill with 25' wide berm at Elevation 10 mean sea level, and frontal slope of 20 horizonal to 1 vertical. The inshore line of the 25' wide berm shall be the "Toe of Slope of Proposed Seawall" line as shown on map of proposed Sea-Land grant as prepared under Case 68-131. The beachfill plan shall include appropriate fitting of the new beachfill into the existing beaches to the east and west of the Sea-Land Seawall.

It is considered that the dry beach as measured from the inshore line of the berm to the project high water line, being the +2' mean sea level contour, will be equivalent to the authorized project beach in terms of Project Recreation Benefits.

2. The Navigation Bureau shall prepare contract drawings and specifications for the new beachfill and submit them to the Corps for approval in the same manner as local projects under cooperative projects are cleared. The Bureau project will be considered as an amendment to the Authorized Project and will have to be formalized by appropriate amendment to the Local Cooperation Assurances of the Authorized Project.

3. The State shall obtain and furnish to the Corps the perpetual easement covering a portion of the new beach area to be given to the State by Sea-Land as per Condition No. 2 under Case 68-131. It is understood that the area of this easement shall be the property owned by Sea-Land after the grant conveyance lying between the Toe of Seawall Line and the exterior (outshore) line of the riparian grant as shown on proposed grant map in Case No. 68-131. In addition, it is considered desirable that the Natural Resources Council by appropriate action dedicate or otherwise assure the existence in perpetuity of the portion of the new beachfill outshore of the proposed Sea-Land grant exterior line as a public beach with title remaining vested in the State.

4. When the contract drawings and specifications are approved by the Corps, the new beach shall be constructed by either the State or Sea-Land as agreeable to the State without any Federal participation. Pursuant to Condition No. 3 of Case 68-131, the project cost of beachfill construction shall be borne by Sea-Land. The State's engineering and inspection costs are considered part of the beachfill project cost and are to be included in the estimated project cost.

5. The new beach is to be maintained by the State and Madison Township as per Local Cooperation Assurances. The Sea-Land Seawall and the lands rearward of the seawall are the responsibility of the Owner.

Condition No. 4: Permanent Access Easement

1. The State shall obtain from Sea-Land and furnish documentary evidence of an easement in perpetuity for public access across the lands of Sea-Land to the new beach at three locations along the Sea-Land bayfront, such locations being compatible with the Sea-Land plan for development of the property rearward of the Sea-land Seawall and subject to Federal and State approval and acceptance. The intent is to assure convenient public access

May 20, 1970

Director K. H. Croveling

to the beach and appropriate dispersion of beach population without inhibiting design for use of Sea-Land property.

Comments

1. The Contract Plans and Specifications will be prepared for submission to the Corps in order to advance this case.

2. Sea-Land will be advised of the conclusions reached by consultation with the Corps as to the Conditions under Case 68-131.

3. Joint field inspection with Corps will be arranged for near future to assure full mutual understanding based on direct observations in the field. The inspection will include the entire Authorized Project frontage as well as the Sea-Land portion.

JKR:ms

James K. Rankin, Chief
Bureau of Navigation

cc: Mr. Frank Kelly
Mr. A. Scoppetuolo
Mr. J. P. Marron
Mr. H. W. Boud
Mr. C. F. Wicker

Exhibit C

MEMORANDUM

DATE October 19, 1970

TO: Deputy Commissioner Joseph T. Barber

FROM: Mr. James K. Rankin

SUBJECT: 68-131: Sea Land Development Corp.; Riparian Grant, Raritan Bay, Madison Township

32.01:420-156-855: Madison Township Cooperative Hurricane and Shore Protection Project (1970)

On October 15, 1970 you advised that Sea Land has proposed furnishing $55,000. to reimburse the Federal Government for its expenditure in connection with placement of beachfill along the Sea Land bayfront property at Madison Township. It was understood that the offer was intended to remove Condition No. 3 of the four stipulated by Council in approving grant. The four conditions specified are:

1. Applicant to deed back its title to that portion of the grant dated December 18, 1922 covered by its deed.

2. Applicant to convey a perpetual easement for a beach area of 2.808 acres of grant to be conveyed.

3. Applicant to create a beach acceptable to the U. S. Army Corps of Engineers to replace one constructed under its coast protection project.

4. Applicant to provide public access over its property to proposed beach area.

Comment

1. The $55,000. represents only the Federal investment as estimated by the Corps of Engineers. The State and Madison Township would have to be compensated also in amount of $60,000. based on the Corps computation.

2. In order to report the offer to the Council for its decision, it would be necessary for Madison Township to make a formal request and recommendation.

3. The Council action, if favorable, would be subject to formal application to and approval by the Corps of Engineers.

JKR:ms

James K. Rankin, Chief
Bureau of Navigation

Exhibit D

Township of Madison

MIDDLESEX COUNTY, N. J.

BOX 70-C, R.D. NO. 1
OLD BRIDGE, N.J. 08857

(201) 721-6600
Conservation Commission

REPLY TO: 068 B AMBOY ROAD
R. D. 1
MATAWAN, N. J. 07747

September 29, 1972

Mr. A. W. Price, Chief
Solids Waste Management Div.
Dept. Of Environmental Protection
Box 1390
Trenton, N. J., 08625

Dear Mr. Price,

This is to confirm our telephone conversation regarding the land fill operation being conducted on the Laurence Harbor beach front on Raritan Bay, in Madison Township.

I am enclosing two photographs taken at the site of this operation which show in some detail the problems to which I referred.

Photo No. 1 is of a man recovering lead metal from the recently dumped slag used for the land fill. This slag, probably from the lead melting operation of National Lead in Perth Amboy would also contain other heavy metals and metal sulphates normally associated with the raw material. As can be seen the land fill has passed the high tide mark and the dumping is taking place right into Raritan Bay therefore these metals and their soluble salts pose an additional threat to increasing the pollution in the bay.

Photo No. 2 shows the removal of an ingot of solid lead from this same slag dump. I estimate the ingot weight to be about one half ton. While all the slag is not solid lead there is a substantial amount in almost all the pieces.

I feel that this land fill operation constitutes a series of improper operations, some that I may not have specifically outlined. I would appreciate receiving a copy of any report your office prepares concerning the land fill.

Very Truly Yours,

George A. Koehler
Chairman

Exhibit E

CLOSE-UP—Several mound-shaped lead slag ingots, some weighing up to a half-ton, are shown on the Laurence Harbor beachfront. George Koehler, chairman of the township's Environmental Commission, wants the state to halt the lead dumping.

The News Tribune
WOODBRIDGE, N. J., TUESDAY, OCTOBER 3, 1972 ★★★

State to probe dumping of lead slag

By ROBERT WINDREM
News Tribune Staff Writer

MADISON TOWNSHIP — The state Department of Environmental Protection has agreed to send a field representative to the Laurence Harbor beachfront to investigate the dumping of lead slag along the water line.

George R. Koehler, chairman of the township's Environmental Commission, said at last night's township council meeting that the department's Division of Waste Management has promised to send a representative to investigate the practice of trucking lead slag from Perth Amboy to Laurence Harbor, where it is dumped.

Koehler said the slag, large mound-line, making it unusable for recreation. To substantiate his story, Koehler said he has sent photographs of the dumping to A. W. Price, the division chief.

He said the photographs were taken Sept. 16, and an inspection of the area Sunday showed that more slag had been dumped on the same section of the beachfront, which is privately-owned. It lies just south of the township's public beach in Laurence Harbor.

"This slag, probably from the lead smelting operation of National Lead in Perth Amboy, would also contain other heavy materials and metal sulphates associated with the raw material," Koehler said, adding that the metals and soluble salts pose an additional threat to increasing pollution in the bay.

"The life expectancy of a fish in lead-polluted waters is 18 to 24 hours," Koehler said, "A mucus forms on the gills of the fish and the fish suffocate. This is particularly bad in light of the fact that the bay is cleansing itself, as evidenced by the fact that people are starting to catch fish off Perth Amboy."

Koehler added that environmental effects aside, the township would be spending wasted money on Green Acres applications if the practice is allowed to continue and the present damage allowed to remain.

He added that the commission, which meets tonight, intends to send a letter on the matter to U.S. Attorney Herbert J. Stern, based on the fact that the bay is an interstate waterway and under the jurisdiction of the Refuse Act of 1899.

Stern used the Refuse Act to halt the sludge-flushing practices of more than 20 Shore municipalities earlier this year.

Exhibit F

October 5, 1972

Mr. George E. Koehler, Chairman
Township of Madison Conservation Commission
168 E Abbey Road, R. D. #1
Matawan, New Jersey 07747

Dear Mr. Koehler:

Your letter of September 29, 1972 directed to Mr. Arthur W. Prins, Chief of the Bureau of Solid Waste Management has been referred to me for follow-up.

This site was inspected on October 4, 1972 by myself and another member of our staff. Because of the nature of this material and where it is being deposited we have asked the cooperation of Mr. Charles M. Pike, Director of Water Resources and Mr. Richard D. Goodenough, Director of Marine Services.

We wish to take this opportunity to thank you for bringing this situation to our attention.

Very truly yours,

Charles E. Gingrich

Charles E. Gingrich
Principal Environmental Specialist
Bureau of Solid Waste Management

CEG:ls

cc: Director C. M. Pike
Director R. D. Goodenough

Exhibit G

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMO

TO: Director Charles M. Pike

FROM: Mr. Charles E. Gingrich

DATE: October 5, 1972

SUBJECT: Slag disposal, Lawrence Harbor beach front on Raritan Bay, Madison Township, Middlesex County.

Mr. Koehler, Chairman of Madison Township Conservation Commission has brought to our attention the use of slag containing lead and other heavy metals in the construction of a sea wall along ½ mile of Lawrence Harbor beach front and an access road to the sea wall through a tidal swamp. Our Bureau has investigated this and we feel that because of the nature of this material and where it is being deposited that your sections of our Department would be vitally interested.

Attach is a copy of Mr. Koehler's letter and our reply. Also for your information is a copy of a recent newspaper article.

We expect to have lot and block numbers later this week should you require them. A sketch is attached showing general location.

CEG:ls

RECEIVED
OCT 9 1972
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER POLLUTION CONTROL

Exhibit H

Township of Madison

MIDDLESEX COUNTY, N.J.

RECEIVED
OCT 18 10 23 AM '72
DEPT. ENVIR. PROTECT.
DIV. OF WATER RESOURCES

Conservation Commission

REPLY TO: 168 B AMBOY ROAD
R. D. 1
MATAWAN, N. J. 07747

October 16

RECEIVED
OCT 25 1972

Mr. Charles Pike, Director
Division of Water Resources
Dept. of Environmental Protection
Trenton, N.J., 08625

Dear Mr. Pike,

In a recent communication from Mr. Charles E. Gingrich, Bureau of Solid Waste Management, I was advised that the matter of dumping of slag from the lead recovery operation of National Lead Co., into the Seabarea and Raritan Bay at Laurence Harbor, in Madison Township had been refered to you.

The toxicity of the material to aquatic life is well established (Pg. 209 Water Quality Criteria), furthermore the prohibition against dumping industrial waste into tidal waters is clear (Allowable Limits, Class TW-1 waters N.J.S.A. 26:2E-1 et seq. and Standards Class SB waters, Official Classifications, Water Resources Commission)

I have enclosed two photos which I hope will be helpful to you in the persual of this matter:

Photo #1 is of a man recovering lead metal from the slag, samples of this material are available as well as documentation as to the quantity of material recovered.

Photo #2 is of an actual dumping operation by Liberty Trucking.

I feel that this land fill operation constitutes a series of improper operations, some that I may not have specifically outlined. I would appreciate receiving a copy of any report yourofile prepares concerning the land fill.

Very truly yours,

George, R. Koehler
Chairman

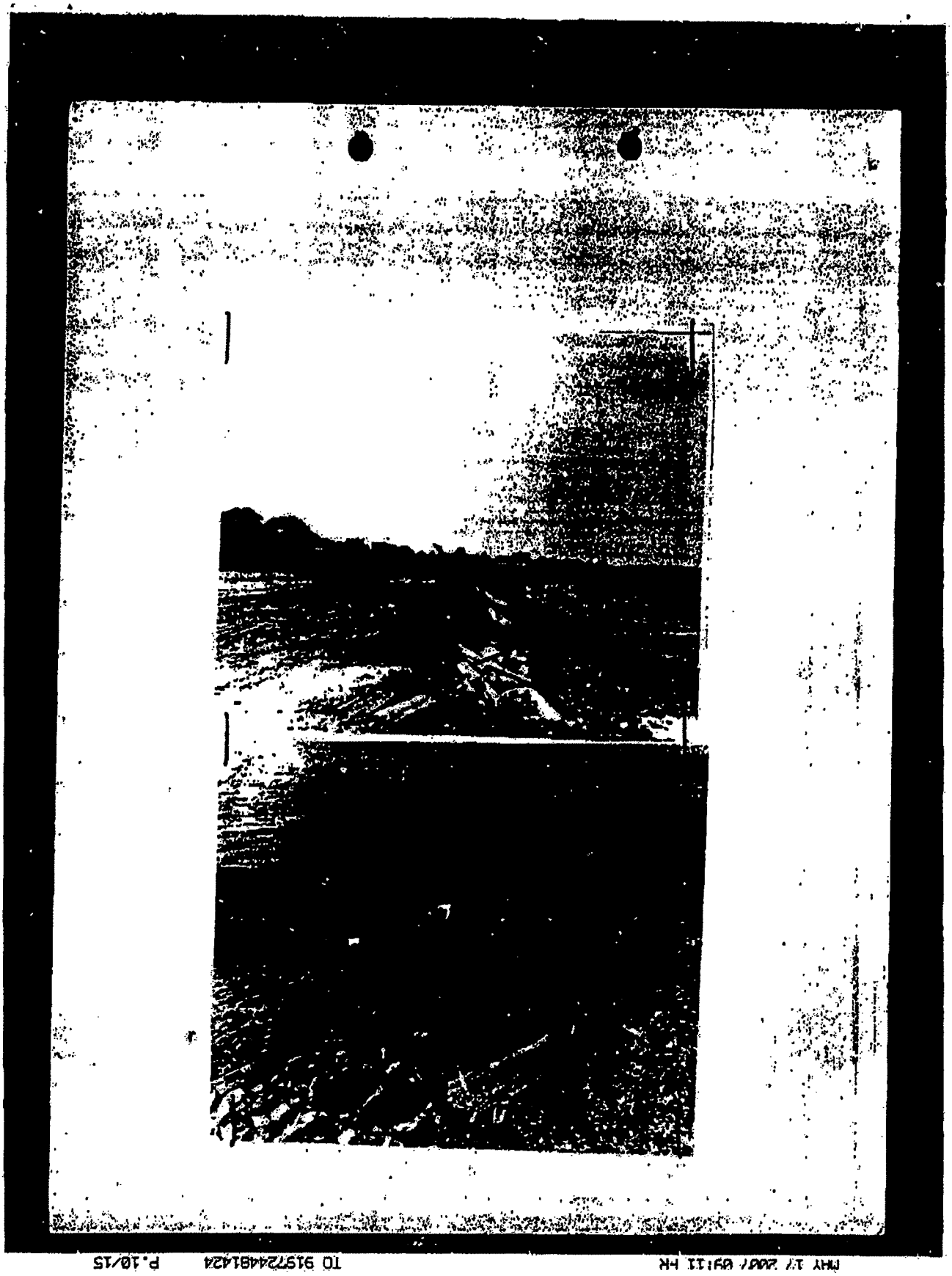


Exhibit I

In Support of Wetlands Order

Concern Shown for Environment

The following testimony in favor of the Wetlands Order was given by George R. Koehler, chairman of the Madison Township Environmental Commission at the Middlesex County hearing at Rutgers on Nov. 10.

The Wetlands Order provides for control of development in the tidal areas of the state, with concern given to the environmental consequences of such development. It specifically prohibits the dumping of industrial waste and garbage both of which activities have caused considerable concern in Madison Township.

The importance of the wetlands of New Jersey cannot be overstated, the irreplaceable part they play in the life cycle of so many marine and bird life forms has been proven, and is well documented in such books as "Life and Death" of the Salt Marsh by John and Mildred Teal published in 1969 by the Audubon-Ballantine Book Co. and in timely articles as "Can We Save Our Salt Marshes" by Dr. Stephen W. Hitchcock which appeared in the June 1972 issue of the National Geographic Magazine. The dependance of man on the abundance of the sea and the air is self evident as is the disaster that would result if man's bungling were to break the life chain that provides for man's sustenance.

Also necessary for man is the recreational values associated with these tide and marsh lands.

Both of these important aspects are evidenced in Madison Township — where along the stretch of coast of Madison Township on Raritan Bay tide marsh as well as beach area exist. The delicate blance of these lands and the rapidity with which these fruitful areas can be destroyed is also very evident as current sanitary landfill operations and industrial waste dumping have made serious inroads into the biotic health of the tidal marsh and the utility of the beach front.

It is the purpose of this testimony to support the Wetlands order by showing that these important areas are in jeopardy due to man's unthinking

(Continued on Page 2)

—Concern for Environment

(Continued from Page 1)

negligence and need the protection offered by the control proposed in the Wetlands Order.

The first item is a sample of lead metal and lead slag removed from a so called landfill operation, but which has become an industrial waste dump, on the shore of Raritan Bay in Laurence Harbor. The lead slag contains lead sulfate and other lead salts. The toxic nature of this material is well known as described in a copy of toxicity data taken from the Water Quality Criteria, published by the U.S. Government Printing Office. While this publication dwells on the vital statistics of morbidity, a very recent article appearing in the New York Times, dated Nov. 9, shows that even slight amounts of this material ingested unknowingly can cause serious harm to young and old.

The extent to which this material has been placed in the dump on the shore of Raritan Bay is shown in the lower photograph on page 1. This photograph, taken on Sept. 9, at the Laurence Harbor beach front shows a slug of what proved to be solid lead being removed by a scavenger from the dump. The slug being dragged out by the chain was later sold for its lead value and had a weight of 500 pounds.

Compounding the problem of the placement of deleterious material in the tide and marshlands is the unknown affect of changing the contour of the shore line. Another photograph, shows such dumping taking place at the Laurence Harbor beach front on Sept. 9. The permit for this dumping expired in December 1970, yet the dumping continued only till recently, demonstrating the need for the permit system proposed in the Wetlands Order.

The permit described in the paragraph above indicated that the purpose of the land fill operation was the creation of a bathing beach for use by the public. The top photograph, taken at the base of the land fill, shows not only that the fill, including lead slag has been dumped directly into the waters of Raritan Bay but also shows the condition that has resulted there. This area once important for its recreational value has been turned into a rubble filled dump, dangerous, toxic and hideous.

The Madison-Township Environmental Comr ission sought assistance in this matter from the Department of Environmental Protection. This assistance was given and the commission has been advised that a stop order has been issued by the Bureau of Navigation on this land fill. The commission feels, however, that the only long term solution to the problem of despoiling these important areas is adoption of the Wetlands Order.

Other important wetlands in the township are being threatened by the unknowing disposal of harmful materials. The Cheesequake Marsh area of Madison Township near the Global Landfill operation shows destruction of this important marsh. Apparently disposal of industrial wastes some years ago in this area is adding to the destruction of the marsh, as proven by an analysis of a liquid sample of substances bubbling up from the ground at the site of an older land fill operation. This noxious material then seeps its way into the Cheesequake marsh further poisoning the life in these tidal lands.

The concern of Madison Township for the preservation of the tide lands and the protection of the beach front is evidenced by the application made for it under both Green Acres and the PNRS-HUD Open Space and Recreation Grant.

The Madison Township Environmental Commission wishes to see these areas protected from the attacks being made on them and also wishes to see these lands returned to their full and balanced state. The commisssion feels that this can best be accomplished by the full and immediate implementation of the proposed Wetlands Order, with the regulfatory provisions of the order implemented in their entirity, without change and applied to all engaging in activities on the wetlands affected by the proposed order.

This statement was adopted at the regular meeting of the Madison Township Environmental Commission on Nov. 9.

Exhibit J

NOTIFICATION OF BEACHFRONT MEETING MARCH 1, 1973 SENT TO:

Corp of Engineers

Mr. F. Pagano
Chief, Engineering Division
26 Federal Plaza - 21st Floor
New York, N. Y. 10007

Mr. Gilbert Nersesian
Chief, Beach Erosion & Hurricane
26 Federal Plaza - 21st Floor
New York, N. Y. 10007

Mr. John Falkenbury
Regulatory Beach Permits
26 Federal Plaza
New York, N. Y. 10007

Mr. Pinata
Asst. Chief of Operation Division
26 Federal Plaza
New York, N. Y. 10007

State

Mr. James K. Rankin, Chief
Department of Environmental Protection
Division of Marine Services
Bureau of Navigation
P.O. Box 1889
Trenton, N. J. 08625

Mr. Harold J. Barker Jr., Chief
Dept of Environmental Protection
Division of Marine Services
Bureau of Marine Lands Management
P.O. Box 1889
Trenton, N. J. 08625

Mr. D. Graham
Supervisor of Permits & Licenses
Bureau of Navigation
P.O. Box 1889
Trenton, N. J. 08625

Mr. Ginridge,
Principal Environmental Specialist
Bureau of Solid Waste Management
Department of Environmental Protection
P.O. Box 1390
Trenton, N. J. 08625

Mr. Richard Dealy, Chairman
Madison Township Planning Board

Mr. Richard Plechner
Madison Township Attorney

Mr. George R. Koehler, Chairman
Conservation Commission
168 B Amboy Road R.D. 1
Matawan, N. J. 07747

Mr. Ken Sandor, (County)
Director of Environmental
Health & Protection
37 Oakwood Avenue
Edison, N. J.

Citizens

Mrs. Rita Van Orden
78 Roosevelt Avenue
Laurence Harbor, N. J.

Mrs. Mary Jacques
58 Boulevard East
Cliffwood Beach, N. J.

Mrs. Helen Ver Strate (L.W.V.)
25 Balmoral Avenue
Matawan, N. J.

Mrs. Dorothy Instrip
81 Roosevelt Avenue
Laurence Harbor, N. J.

000140

Exhibit K

BOX 684
OLD BRIDGE, N. J. 08857

Township of Madison

MIDDLESEX COUNTY, N. J.

OFFICE OF THE ENGINEER
18 THROCKMORTON LANE
TEL. (201) 679-5120

February 23, 1973

Pursuant to our letter of February 21, 1973, we are forwarding herewith a tentative agenda for the meeting of March 1, 1973. This agenda covers the general areas of questions which have arisen in the past and we shall endeavor to follow the agenda.

Very truly yours,

Harvey P. Goldie, P.E.
Township Engineer

HPG:ab
Encl.

A G E N D A

INFORMAL CONFERENCE

Informal conference of interested parties to determine the Township's rights, responsibilities and options with regards to public and private beachfronts and hurricane projects, also to discuss past and present land fills along the beachfront.

1. Call meeting to order 8:30 P.M.

2. Introduction by Manager (agencies present and purpose of meeting)

3. Beachfront Filling

   A. Authorized by permit (federal and/or state)

      1) permits issued, duration of permits
      2) agency issuing permit
      3) permits required
      4) operations not requiring permit

   B. Encroachments

      1) encroachments beyond wetland boundaries
      2) encroachments on riparian lands
      3) encroachments on areas considered navigable waters

   C. Riparian grants

      1) riparian grants issued
      2) riparian grants applied for
      3) do riparian grants require permits under Wetlands Act?

   D. Environmental aspects

      1) state requirements for land fill
      2) does material in land fill endanger environment or ecology of area?

4. Beach Erosion

   A. Hurricane project

      1) explanation of federal, state and municipal contract

         a) Township's responsibility and obligations under contract
         b) State's responsibility and obligations under contract

      2) are bench marks available, and when have cross sections of beachfront been taken?

4. Beach Erosion - Continued

A. Hurricane project

3) Explanation of Corp of Engineers recommendation for immediate maintenance (estimate $41,000.00)

4) Attorney to explain easements - rights of township and rights of property owners.

B. Maintenance and erosion control beyond limits of hurricane projects

1) funding available?
2) Federal and/or state participation

C. Available funding

1) Federal aid programs for beach erosion and shore protection
2) State programs for shore protection

a) Township applications for last ten years
b) Funds granted over last ten years
c) Disposition of present application for shore protection funds

NOTE - Preliminary meeting with Township Council at 8:00 P.M. to discuss legal aspects with regards to present applications pending before state agencies.

Exhibit L

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
JOHN FITCH PLAZA, P. O. BOX 1390, TRENTON, N. J. 08625

February 23, 1973

Mr. Harvey P. Goldie, P.E.
Township Engineer
Office of the Engineer
18 Throckmorton Lane
Box 684
Old Bridge, New Jersey 08857

Dear Mr. Goldie:

This is in response to your letter dated February 21, 1973.

To be brief, we do not feel that the Bureau of Solid Waste Management is involved in the construction of the sea wall along Cliffwood Beach front, as this construction is being made of inert inorganic material. It is possible that the Division of Water Resources of the Department of Environmental Protection may have some interest.

Under these conditions we will not have a representative present at your meeting of March 1, 1973.

Very truly yours,

Charles E. Gingrich

Charles E. Gingrich
Bureau of Solid Waste Management

CEG:pm

Exhibit M

Township of Madison

MIDDLESEX COUNTY, N. J.

Mr. Goldie

BOX 684
OLD BRIDGE, N.J. 08857

MINUTES OF MEETING
RE: BEACHFRONT PROPERTY - March 1, 1973

Present: From the Township:
Mayor English; Councilmen Fuhrman, Murphy, and Wenng;
Manager L. A. Kenyon; Attorney R. Plechner, Engineer
H. Goldie; G. Koehler, Chairman, Conservation Commission
From the Corps of Engineers (New York District):
P. McGrade, Acting Chief, Construction Permit Section;
T. Maisano, Chief of Discharge Section
S. Maisel, Chief of Planning, Engineering Division

Also present from the Township were:
Mrs. Jacques, Mrs. Van Orden, Mrs. Ver Strate & Mr. Fagan

Mr. McGrade reported that ever since the 27 of May, 1970, the Corps of Engineers required permits for any work beyond the line of the average mean high tide. Previous to this, no permit was required for fill to the bulkhead line or pier type structures to the pier line. Neither were ongoing projects on this date required to get a permit, and this would apply to Sealand's project; therefore, no permit is required for their continuing fill operations out to the bulkhead lines. He emphasized that the enforcement of any of these regulations had to be done by the Corps and that local authorities should not act in their behalf on enforcement. They should merely report any suspected violations and the Corps would send an inspector. He was going to determine if there were any pending or current permits in effect at this time in our Township and let us know.

Mr. Maisel pointed out that the Sealand project actually improves the effectiveness of the Hurricane Project, rather than endangering it; therefore, they would not have required a permit in connection with the Township's and State's contractual obligations to maintain and protect this project once it was built. He indicated that, while the rubble in the fill used by Sealand might not be proper material for a beach recreational area, there was no indication that the Township's Hurricane Project was done for recreational purposes or that there was any contractual obligations in this respect. Mr. Maisel also emphasized that this contractual obligation was entirely separate from any federal regulations covering navigable waters. He asked that he be invited to the meeting with State officials when it is set up.

Mr. Maisel explained that the State had applied for federal funds under Public Law #99, which is the "Emergency Restoration of Endangered Projects." As indicated in the excerpts of the Corps of Engineers inspection report read by the Manager, our Hurricane Project was in no way endangered and therefore we were not eligible for these funds.

The Manager stated that we had good reasons to believe that the outfalls had not held up for more than a year or two and were now twisted and out of alignment and were not operating. Mr. Maisel said that this might be a better avenue of approach for federal funds because the Corps ~~were~~ WAS obligated to turn over a completed project with minimum or normal maintenance costs.

The Manager and Engineer explained that the Township had been doing everything it could to get maintenance work performed on the Shore Protection Project and the Township had put in applications for matching funds in 1965, 1968, 1970 and 1972. The 1972 application is pending at this time for some $56,000 worth of work.

The Manager read from copies of the easements obtained by the Township for the construction of this project, indicating that our only rights were for ingress and egress at all times, but only for the purpose of depositing earth materials for the construction and presumably maintenance of the Shore Protection Project.

The Mayor read a letter from Richard Plechner, dated May 12, 1971, returning Sealand's check in the amount of $7,500 on order of the Council. The previous Town Council on August 7, 1967 had adopted a Resolution agreeing to return the Township Easement to Sealand Corporation for this amount.

One of the primary questions asked by Mrs. Jacques and Mrs. Van Orden was what the February 1968 entry in the Chronological History of Riparian Grant Case #68-131, Sealand Development Corp. implied, which states:

> "Representatives of Sealand discovered that the easement which Madison Township had acquired should have contained the provision that the beach was to be used for public purposes in perpetuity."

They indicated this history had been received from Col. Barker, and Mrs. Van Orden promised to deliver copies of the cover letter in connection with this history and other material to the Township Engineer within a few days.

On the Mayor's request, Mrs. Jacques agreed to submit a written list of her questions so that Township officials could get answers from the state at the forthcoming meeting in Trenton.

Mr. Fagan suggested the State be asked the following questions in respect to the Sealand property:

a) Who owns the artificially-created beach that was formed 100 or more yards in width as a result of the Hurricane Protection Project?

b) Aren't our outfalls protected by our easement against damage?

(In other words, what right did Sealand have to pile rubble on top of these outfalls, which, he maintains, has damaged them).

c) Did Sealand begin filling without the necessary Riparian Rights?

The Clerk's office is keeping a copy of the tape of this meeting, which lasted from 8:30 to 11:30 p.m.

Exhibit N

Green Acres Bay First Copy for Sea Land Mr. Goldie

BEACHFRONT PROPERTY MEETING
Trenton, N.J., March 27, 1973; 1:30 p.m.
Room 801, Building of Labor and Industry
Commissioners of the Department of Environmental Protection

Present: James K. Rankin, Chief Liaison Officer, Divn. Marine Services
Bernard J. Moore, Supervisor, Shore Protection
Stanley Maisel, Army Engineers, New York District
Peter C. Newson, Supervisor, Wetlands
John P. Marron, Divn. of Marine Services
Donald T. Graham, Supervisor, Permits & Licenses
James R. Tolinson, Supervisor, Riparian Section
Harold Barker, Chief, Marine Lands Mgt.

From the Township:
Messrs. Kenyon, Fuhrman, Plechner, Goldie, Koehler and Quail

Representatives of the state informed us:

(1) The only application in Madison Township for riparian grant pending before the N.R.C. was by Sea Land and it had been tabled indefinitely, awaiting word from Madison Township on our proposed acquisition of this property through Green Acres.

They further indicated that the sale of riparian property, in addition to being approved by the National Resource Council, must be approved by the Department of Environmental Protection, the Attorney General's Office, and the Governor's Office. It is not a pro forma approval - each department has a reviewing staff to see if it is in the public interest.

(2) The most important piece of information was that the new beach which had accrued as a result of our Shore Protection Project was the property of the State of New Jersey, as it was artificially created. Under riparian laws, only slow, natural accretion belong to the abutting property owners. Therefore, Sea Land, as well as others, only ownsto the old high water line, not the new one formed by the new beach.

More important, they indicated the Township could make application for a riparian grant on this new beach property, preserving our shore line for the public. The Township would have to pay fair market value but could use State Green Acres money or other state funds.

(3) They indicated we would get the money for the beach restoration project and further agreed under Mr. Maisel's urging to send a letter to the Corps of Engineers to participate financially in restoration of the outfalls, on the presumption they were not originally constructed sufficiently well to entail only ordinary maintenance obligations on the State and Township.

(4) Harold Barker agreed to correct the chronological history which indicates that the Township had sold property or easement to Sea Land or others which is not the case, and received from us a copy of Mr. Plechner's letter of May 12, 1971 returning Sea Land's $7,500 check and informing them their offer had been rejected by the Township.

(5) They also promised us a letter concerning the meeting and a report from the Bureau of Water Pollution Control re: lead slag dumped by Sea Land.

They answered all the questions submitted by concerned residents to the extent possible, as well as covering the Township prepared agenda; and again stated they did not feel a public hearing away from their files could be profitable, indicating that they had offered and were always ready to meet with citizens and officials at their office on any of these matters.

Mr. Barker personally told the concerned citizens by phone they could go down and review the records with a representative of the Attorney General's office present to help answer legal matters.

Previous to Governor Cahill's 1970 establishment of a review board, riparian grants were practically automatic, and deposit by the applicant of one-half the consideration plus permit fee allowed him to begin construction or filling operations.

(See Cease and Desist Order of October 31 from Mr. Rankin to Sea Land in file).

L. A. Kenyon/ms

3-27-73

JAMES K RANKIN - CHIEF LIAISON OFFICER - DIV. MARINE SER.
BERNARD J. MOORE - SUPERVISOR - SHORE PROTECTION
George R. Koehler - Madison Twp Environmental Comm.
Bernard Feldman - Councilman - Madison Twp.
Stanley Praamsma - Army Engr. New York Dist.
Joseph P. Dunn - Health Administrator Madison Twp.
RICHARD F. PLECHNER - TOWNSHIP ATTY. MADISON TWP.
Harvey P. Goldie - Township Engineer, Madison Twp.
L. A. KENYON - MADISON TWP MGR.
PETER C. NEWSON - SUPERVISOR - WETLANDS.
JOHN P. MARRON - DIV. MARINE SERVICES.
DONALD T. GRAHAM - SUPERVISOR - Permits & Licenses
James R. Johnson - Supervisor - Riparian Section
Harold Barker - Chief - Marine Lands Mgt

Exhibit O

REPORT

OF THE

SECRETARY OF WAR;

BEING PART OF

THE MESSAGE AND DOCUMENTS

COMMUNICATED TO THE

TWO HOUSES OF CONGRESS

AT THE

BEGINNING OF THE FIRST SESSION OF THE FORTY-SEVENTH CONGRESS.

IN FOUR VOLUMES.

VOLUME II.
PART 1.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1882.

REPORT

OF

THE CHIEF OF ENGINEERS,

UNITED STATES ARMY.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., October 22, 1881.

SIR: I have the honor to present for your information the following report upon the duties and operations of the Engineer Department for the fiscal year ending June 30, 1881.

OFFICERS OF THE CORPS OF ENGINEERS.

The number of officers holding commissions in the Corps of Engineers, United States Army, at the end of the fiscal year was 106 on the active list and 7 on the retired list; the latter, however, under the law of January 21, 1870, not being available for duty. In the duties devolving upon the Corps by law and by its organizations, the employment of a number of scientists and assistant engineers has been necessary.

Since the last annual report the Corps has lost by death, resignation, and retirement, three of its officers: Capt. Charles B. Phillips, who died at Norfolk, Va., June 14, 1881; Lieut. Samuel E. Tillman, who resigned, to date December 31, 1880; and Col. John G. Barnard, who was retired January 2, 1881, in conformity with provisions of section 1244, Revised Statutes, being over sixty-two years of age, and having served over forty-five years as a commissioned officer.

There have been added to the Corps, by promotion of graduates of the Military Academy, two second lieutenants and three additional second lieutenants, whose commissions date from June 11, 1881, but who did not become available for duty till after the close of the year, and are, therefore, not included in the strength of the Corps.

On the 30th June, 1881, the officers were distributed as follows:

On duty, Office Chief of Engineers, including the Chief	4
On duty, fortifications	1
On duty, fortifications and light-house duty	1
On duty, fortifications and river and harbor works	13
On duty, fortifications, river and harbor works, and light-house duty	1
On duty, fortifications, river and harbor works, and "The Mississippi River Commission"	1
On duty, Board of Engineers	1
On duty, Board of Engineers and river and harbor works	1
On duty, Board of Engineers, fortifications, and river and harbor works	3
On duty, Board of Engineers, Battalion of Engineers and fortifications	1
On duty, river and harbor works	27
On duty, river and harbor works and light-house duty	3
On duty, river and harbor works, light-house duty and "The Mississippi River Commission"	1
On duty, survey of northern and northwestern lakes, and "The Mississippi River Commission"	1

SAILING VESSELS, BARGES, AND STEAMBOATS.

Side-wheel steamboat	1
Propeller	1
Number of vessels owned (sailing)	48
Number of vessels, transient (sailing)	60
Number of barges, transient	50

Draught of water of the above vessels ranges from 5 feet to 9 feet.

D 18.

IMPROVEMENT OF CHEESEQUAKES CREEK, NEW JERSEY.

The survey of this creek was directed by the act approved March 3, 1879, and the results of the survey and a project for improvement from Raritan Bay to Whitehead's, a distance of 3 miles, with estimates of cost were reported December 23, 1879. Estimated cost $75,279.

The improvement was to consist of two parts. First, a change in the direction of the outlet, which by accumulations of sand formed by waves and currents is now forced in a direction nearly parallel with the beach, having a navigable depth over extensive flats of 1 foot at mean low-water. The course of the outlet will be changed and carried through the present beach by dredging a channel 200 feet wide nearly at right angles to its direction and 5 feet in depth at low-water: The new outlet will be sustained by two parallel jetties of stone, each about 1,500 feet long, and the existing outlet will be closed.

The navigation within the creek is to be improved by cutting off sharp bends and by dredging so as to secure a channel with a depth of 4 feet at low-water, and width of 100 feet as far up as Whitehead's.

By the act approved June 14, 1880, the sum of $20,000 was appropriated for this improvement, which it was decided to devote, as far as it would go, to the improvement of the outlet. As dredging the way for a new outlet would involve encroachment upon private property, the owner, Mr. David Noble Rowan, voluntarily offered the land to the government for the purpose of the improvement, and the papers in the case have been lately finished and recorded.

Proposals have been asked by public advertisement for the dredging of the new outlet, the closing of the present outlet, and the partial construction of the jetties.

1. The original condition of the channel over the bar or shoal at the mouth gives a depth of 1 foot at mean low-water; the channel in the creek has a depth of 4 feet at mean low-water for about ¾ of the length to be improved, and for the remaining portion a depth from 4 feet to 1½ feet at low-water; the course of the creek is very crooked and requires to be straightened.

2. The originally adopted project for the improvement was the change of the outlet into a direction at right angles to the beach; to sustain this direction by parallel jetties of stone, and to straighten the course of the creek and increase the depth in the upper portions thereof.

3. Nothing was expended to the close of the fiscal year ending June 30, 1880.

4. The condition of the creek and outlet at that date was unaltered.

5. The amount expended during the year ending June 30, 1881, was $129.82, and no alteration was made in the original condition of the outlet and creek.

6. The amount available, $19,870.18, can be profitably expended during the year ending June 30, 1882, in changing the direction of the outlet; in closing the present outlet, and in a partial construction of the jetties at the mouth.

7. The estimated amount required for the entire and permanent completion of the work of improvement in accordance with the approved and adopted project is $50,279.

The amount of commerce of Cheesequakes Creek is estimated by one of the parties interested at $110,000 per annum.

Among the exports are clay and molding sand, of the former 15,000 or 20,000 tons annually; and it is supposed by residents that the trade by water will be much increased after the navigation has been improved.

This work is in the collection district of Amboy, N. J. Nearest port of entry, Perth Amboy, N. J. Nearest light-house, Princess Bay.

Amount of revenue collected during the past fiscal year, ———. Amount of commerce to be benefited by this improvement is about $110,000.

AMOUNTS APPROPRIATED.

By act of Congress approved June 14, 1880	$20,000 00
By act of Congress approved March 3, 1881	5,000 00
Total	25,000 00
Amount expended	129 82

ORIGINAL ESTIMATE.

At mouth of creek:	
3,000 linear feet of timber foundation for jetties, at $4	$12,000
10,000 cubic yards of stone in jetties, at $1.75	17,500
50,000 cubic yards of dredging between jetties, at 16 cents	8,000
550 linear feet of pile-dike, at $6	3,300
Cut from New Landing to Forman's Dock:	
6,000 cubic yards of dredging, at 27 cents	1,620
32,000 cubic yards of dredging, at 16 cents	5,120
1,000 linear feet of pile-dike, at $6	6,000
Cut above Forman's Dock:	
4,000 cubic yards of dredging, at 27 cents	1,080
23,000 cubic yards of dredging, at 16 cents	3,680
300 linear feet of pile-dike, at $6	1,800
Deepening channel to Whitehead's Dock:	
11,000 cubic yards of dredging, at 16 cents	1,760
At mouth of Brick Creek:	
200 linear feet of pile-dike, at $6	1,200
Deepening channel of Stump Creek:	
15,000 cubic yards of dredging, at 16 cents	2,400
Engineering and contingencies, 15 per cent	9,819
	75,279

Money statement.

July 1, 1880, amount available	$20,000 00	
Amount appropriated by act approved March 3, 1881	5,000 00	
		$25,000 00
July 1, 1881, amount expended during fiscal year, exclusive of outstanding liabilities July 1, 1880		129 82
July 1, 1881, amount available		24,870 18
Amount (estimated) required for completion of existing project		50,279 00
Amount that can be profitably expended in fiscal year ending June 30, 1883		32,000 00

Statistics of commerce for year ending June 30, 1881.

Class.	Number.	Tonnage.	Draught.
Sloops	152	50 to 80 each	4 to 6 feet.
Schooners	30	80 to 200 each	4 to 7 feet.
Barges	146	100 to 300 each	5 to 7 feet.
Steam-vessels	232	Not known	

These vessels carry manure, gas-house lime, poudrette, &c., up the creek, and bring down fire and potter's clay, molding sand, cord-wood, bricks, and iron ore.

D 19.

SURVEY OF BRONX RIVER, OR WEST FARMS TIDE-WATER CREEK, FROM ITS MOUTH TO THE CITY OF NEW YORK.

UNITED STATES ENGINEER OFFICE,
New York, January 14, 1881.

GENERAL: I have respectfully to report upon the survey of the "Bronx River, or West Farms tide-water Creek, from its mouth in the city of New York," as provided for in the river and harbor act approved June 14, 1880.

The Bronx River is in the collection district of New York.
The city of New York is the nearest port of entry.
The nearest light-house is the North Brother Light.
The amount of revenue collected at New York during the past fiscal year was $131,812,349.89.

The amount of commerce and navigation to be benefited by the proposed improvement is not known, but the vessels navigating the river are very few, and most of the freighting is done by one propeller, and a few canal boats, loaded with coal.

Owing to the risk of navigating the creek, it is difficult to find a pilot to take charge of a vessel going up or down the river.

The creek empties into the East River by a shallow and tortuous channel winding through a mud flat, and obstructed by shoals varying in depth from 2.7 feet to 3.5 feet at mean low-water.

From the head of the projected dike to the rock 1,600 feet below the West Chester road, the depth is about 6 feet at low-water. Thence to the West Chester road, 3.3 feet to 5 feet. From the West Chester road to the gas-works the depth is from 3 feet to 2 feet at low-water. From the gas-works up for a distance of 2,400 feet the depth varies from 2 feet to 0 feet at low-water. Thence to the dam, about 1,100 feet farther up, the bottom is bare at low-water, with the exception of a small stream a few inches deep, which flows from the tail-race of the mill.

The Bronx is a tidal stream, as far up as the dam at West Farms. The rise and fall diminish somewhat after passing above the West Chester road bridge.

The amount of fresh water is large, but works are now under construction on the part of the city of New York to divert the main supply of this water for the use of the city. After the completion of these the amount of fresh water following the course of the creek will be greatly reduced.

It has been found very difficult to obtain a statement of the improvements needed for the purposes of commerce, either present or prospective, Appendix A* being the only one received, and the main object of any improvement being apparently to escape the rates charged for freight by the railroad.

* Omitted. Printed in House Ex. Doc. No. 54, Forty-sixth Congress, third session.

Exhibit P

MEMORANDUM TO FILE

CENAN-RE 30 AUG 1995
SUBJECT: CHEESEQUAKE CREEK, N.J.
SOURCE: CENAN-OP P.73

EXISTING PROJECT (adopted 1880) provides for:

Channel Improvement:

A channel, 5 ft. deep and 100 ft. wide, from the 5 ft. contour in Raritan Bay to the mouth of the creek, a distance of about 1,600 ft. Two parallel stone jetties 200 ft. apart, one on each side of the entrance channel. A pile dike to close off the old outlet. A channel, 4 ft. deep and from 50 to 100 ft. wide, to the head of navigation at Whitehead Dock, including straightening of two bends. Three pile dikes, one 700 ft. long and the other two each 300 ft. long, to protect channel. A channel 3 ft. deep, 50 ft. wide and 3,500 ft. long in Stump Creek.

PROGRESS: The project is about 45% complete. The last work done in carrying out the project was in 1884. Maintenance dredging has been done several times since then. The work accomplished consists of the construction of two parallel stone jetties at the mouth, the construction of a sheetpile dike closing the old channel and dredging a new outlet about 1,600 ft. long, 100 ft. wide and 5 ft. deep at mean low water. The unfinished parts of the project are: dredging a channel 4 ft. deep and 50 to 100 ft. wide between the railroad bridge and the head of navigation, including the contruction of three dikes; and dredging in Stump Creek. Incompleted work is inactive.

COST: $40,000.00
BB073 COEMIS

Realty Specialist

MEMORANDUM TO THE FILE

CENAN-RE 31 JUL 1995

SOURCE: Annual Report

CHEESEQUAKE CREEK CHANNEL IMPROVEMENT

1. Two Stone Jetties of Rock, parallel 200 feet from each other

2. Sheet-pile dike clossing the old channel

COST 40,000

Noreen Dean Dresser
Realty Specialist

ETF:md

17 January 1952

NANRC

SUBJECT: Final Audit of Civil Works Project Land Records re: Cheesequake Creek Channel Improvement, New Jersey, Audited Project No. C-657

TO: The Division Engineer
North Atlantic Division
Corps of Engineers
90 Church Street
New York 7, N. Y.

ATTENTION: NADRC

1. Reference is made to letter from this office dated 27 November 1951 and subsequent indorsements thereto, subject as above.

2. Inclosed is one (1) print of Final Project Map for the Cheesequake Creek Channel Improvement, located in Madison Township, Middlesex County, New Jersey.

FOR THE DISTRICT ENGINEER:

1 Incl.
Final Project Map

MILTON A. PEARL
Chief, Real Estate Division

SUBJECT: Final Audit of Civil Works Project Land Records re: Cheesequake Creek Channel Improvement, New Jersey

601.1 (27 Nov 51) ENGLR 4th Ind

Office of the Chief of Engineers, Washington 25, D. C. 3 January 1952

TO: Division Engineer, North Atlantic Division, Corps of Engineers, New York, New York

1. The Permanent Real Estate Ledger and Final Map completed in the New York District for Cheesequake Creek Channel Improvement, the land for which was wholly acquired prior to 1 January 1943, have been approved and assigned Audited Project Number C-667.

2. The Audited Project Number should now be inserted on the Permanent Real Estate Ledger and Final Map.

3. In the event of either disposal or reassignment action relating to audited projects, appropriate changes should be recommended to this office in accordance with paragraph B 3a (2), Part I of the Real Estate Final Audit of Civil Works Projects - General Instructions.

BY ORDER OF THE CHIEF OF ENGINEERS:

Incl: w/d

V. E. SAARI
Chief, Realty Requirements Division
Real Estate

NADRC (27 Nov. '51) 5th Ind.

SUBJECT: Final Audit of Civil Works Project Land Records re: Cheesequake Creek Channel Improvement, New Jersey

Office, Division Engineer, North Atlantic Division, Corps of Engineers, New York 7, New York, 7 January 1952

TO: The District Engineer, New York District, Corps of Engineers, New York 13, New York

To note the approval of Final Map and Permanent Real Estate Ledger covering subject Civil Works Project and assignment of Audited Project No. C-657.

BY ORDER OF THE DIVISION ENGINEER:

L. P. WALKER
Chief, Real Estate Division

NADRC (27 Nov 51) 3rd Ind

SUBJECT: Final Audit of Civil Works Project Land Records re: Cheesequake Creek Channel Improvement, New Jersey

Office, Division Engineer, North Atlantic Division, Corps of Engineers, New York 7, New York, 12 December 1951

TO: The Chief of Engineers, Department of the Army

ATTENTION: ENGLH

Recommend approval of final audit assembly covering subject Civil Works project and assignment of Audited Project Number.

FOR THE DIVISION ENGINEER:

1 Incl
n/c

L. P. WALKER
Chief, Real Estate Division

NANRC (27 Nov 51) 2nd Ind
SUBJECT: Final Audit of Civil Works Project Land Records re: Cheesequake Creek Channel Improvement, New Jersey

New York District, Corps of Engineers, 90 Lafayette St., New York 13, N. Y., 6 December 1951

THRU: The Division Engineer, North Atlantic Division, Corps of Engineers, 90 Church St., New York 7, N. Y. ATTN: NADRC

TO: The Chief of Engineers, Department of the Army, Washington 25, D. C. ATTN: ENGLM

1. It is the opinion of this office that the notation referred to in paragraph 1 of preceding 1st Indorsement would normally appear in the remarks column of the Tract Register, ENG Form 1019. However, inasmuch as a Tract Register is not required in this instance, the notation has been inserted in the Remarks Column of the Project Map.

2. Project Map is returned herewith for approval and assignment of Audited Project Number.

FOR THE ACTING DISTRICT ENGINEER:

1 Incl (in trip)
Final Project Map

MILTON A. PEARL
Chief, Real Estate Division

NADRC (27 Nov 51) 1st Ind

SUBJECT: Final Audit of Civil Works Project Land Records re: Cheesequake Creek Channel Improvement, New Jersey

Office, Division Engineer, North Atlantic Division, Corps of Engineers, New York 7, New York, 30 November 1951

TO: The District Engineer, New York District, Corps of Engineers, New York 13, New York

1. Upon reviewing the Permanent Real Estate Ledger ENG Form 1628 for the subject project, prepared during visit by representative of Office, Chief of Engineers, it is noted that a notation appears under the Remarks column that "Title reverts to former owners when lands cease to be used for channel purposes". It is the opinion of this office that this notation should appear on the project map under the Remarks column of the Acquisition Tract Register.

2. It is requested that the above notation, if correct, be placed on the map herewith inclosed and resubmitted to this office for transmittal to Office, Chief of Engineers for approval and assignment of Audited Project Number.

BY ORDER OF THE DIVISION ENGINEER:

1 Incl
n/c

L. P. WALKER
Chief, Real Estate Division

27 November 1951

NADRE

SUBJECT: Final Audit of Civil Works Project Land Records re: Cheesequake Creek Channel Improvement, New Jersey

TO: The Division Engineer
North Atlantic Division
Corps of Engineers
90 Church Street
New York 7, N. Y. NADRE

TO: The Chief of Engineers
Department of the Army
Washington 25, D. C. ENGLE

1. Pursuant to instructions from your office the Final Audit of Land Records pertaining to the subject installation has been completed.

2. Inclosed are reproducible print and two (2) copies of the Final Project Map for the Cheesequake Creek Channel Improvement, New Jersey, located eleven (11) miles east of New Brunswick and four (4) miles southeast of Perth Amboy, Middlesex County, New Jersey. The foregoing map supersedes all maps previously transmitted to your office.

3. It is requested that your approval of the inclosure and assignment of the Audited Installation Number be forwarded to this office in order that the records of this office may be noted accordingly.

FOR THE DISTRICT ENGINEER:

1 Incl (in trip)
Final Project Map

MILTON A. PEARL
Chief, Real Estate Division

THIS INDENTURE made the Eighteenth day of August in the year of our Lord one thousand Eight hundred and eighty.

BETWEEN Daniel Noble Rowan and Margaret H. his wife of the Village of Irvington, in the County of Westchester and State of New York, of the first part: And the United States of America of the second part:

WITNESSETH, That the said party of the first part, for and in consideration of the sum of One Dollar lawful money of the United States of America, to them in hand well and truly paid by the said party of the second part, at and before the ensealing and delivery of these presents, the receipt whereof is hereby acknowledged and the said party of the first part therewith fully satisfied, contented and paid, have given, granted, bargained, sold, aliened, released, enfeoffed, conveyed and confirmed, and by these presents do give, grant, bargain, sell, alien, release, enfeoff, convey and confirm to the said party, of the second part, forever. All that certain piece, tract or parcel of land, situate, lying and being in the Township of Madison (late South Amboy) in the County of Middlesex and the State of New Jersey. Being part of Subdivision No. 49 and colored red, on a certain map of land of David N. Rowan, as surveyed by Griffith Jones, surveyor and Civil Engineer, in November 1862, and mapped and subdivided by Geo W. Archibald, Civil Engineer in November, 1874, and courses on said map by Magnet as of 1874, and filed in the office of the Clerk of said Middlesex County, N. J. entitled Map of the land of David Noble Rowan in the Township of Madison, Middlesex County, N. J. 31st Dec.1874, bounded and described as follows:- Beginning at a point (20) feet Southeasterly from the

Easterly end of the County Bridge as it now stands, crossing at the mouth of Cheesequake Creek on a line which runs North 35° 45' East from said Cheesequake Creek to Raritan Bay, taking in all the land between said line and a parallel line two hundred feet Southeasterly therefrom and running between said Cheesequake Creek and the Raritan Bay.

THE intention of this Deed is to give to the United States of America, the right to cut and maintain a channel two hundred feet wide, between said Cheesequake Creek and said Raritan Bay, as indicated upon the diagram hereto annexed, and when said land shall cease to be used as a channel for boats, between said Cheesequake Creek and said Raritan Bay, the same shall revert back to the parties of the first part their heirs or assigns.

DIAGRAM

TOGETHER with all and singular the houses, buildings, trees, ways, waters, profits, privileges and advantages, with the appurtenances to the same belonging or in anywise appertaining. Also, all the estate, right, title, interest, property, claim and demand whatsoever, of the said parties of the first part, of, in, and to the same and in and to any part and parcel thereof TO HAVE AND TO HOLD, all and singular the above described tract or parcel of land and premises, with the appurtenances, unto the said party of the second part, to the only proper use, benefit and behoof of the said party ~~of the~~ of the second part forever: and the said David Noble Rowan doth, for himself and heirs, executors and administrators, convenant and grant, to and with the said party of the second part, that they the said parties of the first part are the true, lawful and

right owners of all and singular the above described land and premises, and of every part and parcel thereof, with the appurtenances thereunto belonging: and that the said land and premises, or any part thereof, at the time of the sealing, and delivery of these presents, are not encumbered by any mortgage, judgment or limitation, or by any encumbrance whatsoever, by which the title of the said party of the second part, hereby made or intended to be made for the above described land and premises, can or may be charged, changed, altered or defeated in any way whatsoever: and also, that the said parties, of the first part now have good right, full power, and lawful authority, to grant, bargain, sell and convey, the said land and premises in manner aforesaid.

AND ALSO, that the said Daniel Noble Rowan, will warrant, secure and forever defend the said land and premises unto the said United States of America forever, against the lawful claims and demands of all and every person or persons, freely and clearly, freed and discharged of and from all MANNER of emcumbrances whatsoever.

IN WITNESS, Whereof the said parties of the first part have hereunto set their hands and seals the day and year first above written.

Signed, Sealed and Delivered in the presence of
William J. Lardner
Salmon Vos

Daniel Noble Rowan (S. S.)

M. N. Rowan (S. S.)

State of New York
City and County of New York } s. s.

Be it remenbered that on this 19th day of August, in the year one thousand eight hundred and eighty, before me personally appeared Daniel Noble Rowan and Margaret H. his wife, who I am satisfied are the grantors in the within Deed of Conveyance named: and I having first made known to them the contents thereof, they did each acknowledge that they signed, sealed and delivered the same as their voluntary act and deed for the uses and purposes therein expressed. And the said Margaret H. being by me privately examined, separate and apart from her said husband did further acknowledge, that she signed, Sealed and delivered the same as her voluntary act and deed, Freely, without any fear, threats, or compulsions of her said husband.

William J. Lardner
Notary Public, (143) N. Y. County

State of New York
City and County
of New York } s s.

I William A. Butler, Clerk of the city and County of New York, and also Clerk of the Supreme Court for the said city and County, the same being a Court of Record. Do hereby certify that William J. Lardner, whose name is subscribed to the certificate of the proof or acknowledgement of the annexed instrument, and thereon written, was at the time of taking such proof and acknowledgement, a Notary Public in and for said County duly

commissioned and sworn and authorized by the laws of the State, to take the acknowledgements and proofs of deeds or conveyances for lands, tenements or hereditaments in said State.
And further, that I am well acquainted with the handwriting of said Notary Public, and verily believe that the signature to said certificate of proof ar acknowledgement is genuine.
In testimony Whereof I have hereto set my hand and affixed the seal of the said Court and County, the 25th day of Aug. 1880.

(S. S.) Wm. A. Butler,

Clerk.

Received and recorded May 14th 1881 at 9 A. M.

Charles S. Hill, Clerk

Mailed to A. L. Queasbey U. S. District Attorney, Newark, N. J. on June 22d, A. D. 1881.

J.

----------oOo----------

NOTE:- Mr. A. D. Bailey, U. S. Inspector, of this office copied the above from the records filed in the County Clerk's office at New Brunswick, Middlesex County, New Jersey, on Monday, January 14, 1907, for file, in connection with application of Joseph Crawford to build a pier at the mouth of Stump Creek, N. J., a tributary of Cheesequake Creek.

----------oOo----------

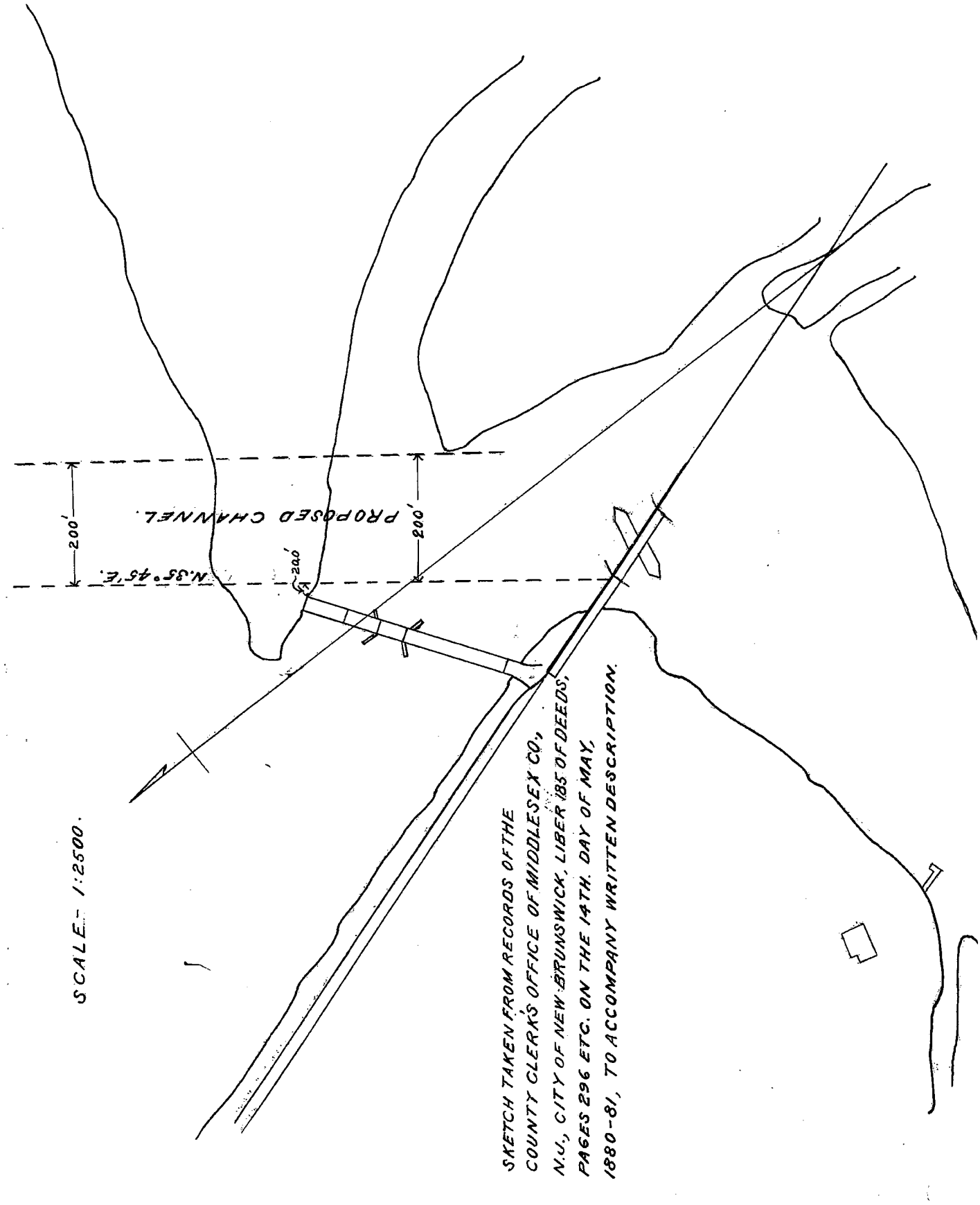

PROPOSED CHANNEL
200'
200'
200'
N.35°45'E.
SCALE- 1:2500.
SKETCH TAKEN FROM RECORDS OF THE
COUNTY CLERK'S OFFICE OF MIDDLESEX CO.,
N.J., CITY OF NEW BRUNSWICK, LIBER 185 OF DEEDS,
PAGES 296 ETC. ON THE 14TH. DAY OF MAY,
1880-81, TO ACCOMPANY WRITTEN DESCRIPTION.

Exhibit Q

ANNUAL REPORTS, WAR DEPARTMENT

FISCAL YEAR ENDED JUNE 30, 1922

REPORT OF THE

CHIEF OF ENGINEERS

U. S. ARMY

1922

IN TWO PARTS

PART I

WASHINGTON
GOVERNMENT PRINTING OFFICE
1922

ANNUAL REPORT

OF THE

CHIEF OF ENGINEERS

UNITED STATES ARMY

1922

14186—ENG 1922

Financial summary.

Amount expended on all projects to June 30, 1922, after deducting receipts from sales, etc., amounting to $607.46:	
New work	$157,224.41
Maintenance	49,011.85
Net total expended	206,236.26
Total appropriations to date of this report	222,559.26

Fiscal year ending June 30.	1918	1919	1920	1921	1922
Expended for new work					
Expended for maintenance [1]	$233.73	$469.01	$54.57	$914.64	$482.89
Appropriated or allotted					

July 1, 1921, balance unexpended	$16,805.89
June 30, 1922, amount expended during fiscal year, for maintenance	482.89
July 1, 1922, balance unexpended	16,323.00
July 1, 1922, outstanding liabilities	323.00
July 1, 1922, balance available only for maintenance	16,000.00

10. CHEESEQUAKE CREEK, N. J. (C5.)

Location and description.—Cheesequake Creek is a small tidal stream, 6 to 7 miles long, rising in the eastern part of New Jersey near Old Bridge and flowing in a northeasterly direction into Raritan Bay, about 2 miles southeast of South Amboy. The average width between banks is about 160 feet. The drainage area is about 7 square miles. The discharge is small and no data regarding it are available. For location see U. S. Coast and Geodetic Survey chart No. 369.

Original condition.—There were extensive shoals and bars at the mouth, over which the mean low-water depth was about 1½ feet. The old outlet was about one-half mile to the westward of the present outlet. The creek was crooked; it had a depth of 4 feet for about three-fourths of the distance to Whitehead's dock, 3½ miles, which was the head of navigation, and 4 to 1½ feet for the remainder of the distance. The width of the channel varied from 25 to 100 feet.

Previous projects.—None.

Existing project.—This provides for a new outlet, 5 feet deep, from the creek into Raritan Bay, at right angles to the shore line, through a beach which ran across the mouth of the creek from the right bank and which had forced the outlet nearly one-half mile to the westward. This was to be obtained by dredging and constructing parallel jetties of stone 200 feet apart on each side of the dredged channel; the old outlet was to be closed by a pile dike, and a channel 4 feet deep at mean low water and from 50 to 100 feet wide was to be dredged from the mouth to the head of navigation, 3½ miles up the creek. In this distance two dikes were to be built, and a new channel to be made through the marsh was to cut off a bend in the creek. Stump Creek, a tributary stream emptying into the creek near its mouth, was to be improved by dredging a

[1] Not deducting receipts from sales, etc.

channel 50 feet wide and 3 feet deep. The mean range of tides is 5 feet. Irregular tidal fluctuations from 1 to 2 feet, respectively, above or below the mean range are caused by strong easterly or westerly winds. The estimate of cost for new work, revised in 1884, is $90,000. The latest (1917) approved estimate for annual cost of maintenance is $2,500.

The project was adopted by the river and harbor act of June 14, 1880 (S. Doc. No. 69, 46th Cong., 2d sess., and Annual Report for 1880, p. 525). The latest published map is printed in the Annual Report for 1905, page 1048.

Operations and results during fiscal year.—Nothing was done. There were no expenditures during the year. The available balance was withdrawn and carried to the surplus fund on June 30, 1922.

Condition at end of fiscal year.—About 45 per cent of the work contemplated under the existing project has been completed. The work accomplished consists of the construction of two parallel stone jetties at the mouth, the construction of a sheet-pile dike closing the old channel, and dredging a new outlet about 1,600 feet long, 100 feet wide, and 5 feet deep at mean low water. The last work done in carrying out the project was in 1884. Since then maintenance work has been done several times. Considerable dredging was done in the creek by the Ordnance Department of the United States Army in connection with the Gillespie Loading Plant during the war. The head of navigation is at Whitehead's dock. The controlling low-water depth on June 30, 1922, was about 5 feet; the channel had narrowed in places. The total expenditures were $40,000 for new work and $19,387.63 for maintenance, a total of $59,387.63.

Local cooperation.—No conditions were imposed by law relative to the carrying out of the project. As dredging for the new outlet involved encroachment upon private property, the owner, Mr. David Noble Rowan, voluntarily offered and gave the land to the Government for this purpose. Funds were derived from no sources other than Congress with which to carry out the improvement.

Terminal facilities.—No publicly owned wharf is located on this creek. There are six privately owned wharves which adequately accommodate the existing commerce. (For a full description of terminal facilities see H. Doc. No. 652, 66th Cong., 2d sess.)

Effect of improvement.—It appears that the improvement has not advanced sufficiently to affect freight rates.

Proposed operations.—No further work under this project appears necessary at this time. The funds available were withdrawn and carried to the surplus fund on June 30, 1922, and no further funds are requested for the fiscal year ending June 30, 1924.

Recommended modifications of project.—None.

Commercial statistics.—The commerce of the calendar year 1921 consisted of sand, animal and vegetable products, machinery, chemicals, etc.

Comparative statement.

Calendar year.	Short tons	Value.	Calendar year.	Short tons.	Value.
1917	32,283	$197,000	1920	10,138	$4,488,550
1918	50,513	24,351,501	1921	9,183	405,298
1919	34,181	20,148,336			

Passengers carried, none.

The decrease in tonnage in 1920 and 1921 as compared with previous years is due to the relatively small amount of ammunition handled. The decrease in the value of the tonnage of 1921 is due to the lack of tonnage of high value moving to or from the Morgan general ordnance depot. The tonnage in 1921 was handled in vessels usually loaded to 8 feet.

Financial summary.

Amount expended on all projects to June 30, 1922, after deducting receipts from sales, etc., amounting to $1.45:	
New work	$40,000.00
Maintenance	19,387.63
Net total expended	59,387.63
Total appropriations to date of this report	59,387.63

Fiscal year ending June 30.	1918	1919	1920	1921	1922
Expended for new work					
Expended for maintenance[1]	$17.51	$11.68			
Appropriated or allotted					

July 1, 1921, balance unexpended	$2,464.65
Deduction on account of amount carried to surplus fund of the Treasury	2,464.65
Amount (estimated) required to be appropriated for completion of existing project	50,000.00

11. KEYPORT HARBOR, N. J. (C6.)

Location and description.—Keyport Harbor lies at the mouth of Matawan Creek, on the south side of Raritan Bay, 5 miles east of the mouth of Raritan River and about 9 miles west of Sandy Hook, and consists of a bay 1 mile broad. It is sheltered on the east by Conaskonk Point and on the west by Matawan Point. The distance by water to New York City is about 25 miles; to Perth Amboy 5 miles. (See U. S. Coast and Geodetic Survey chart No. 369.)

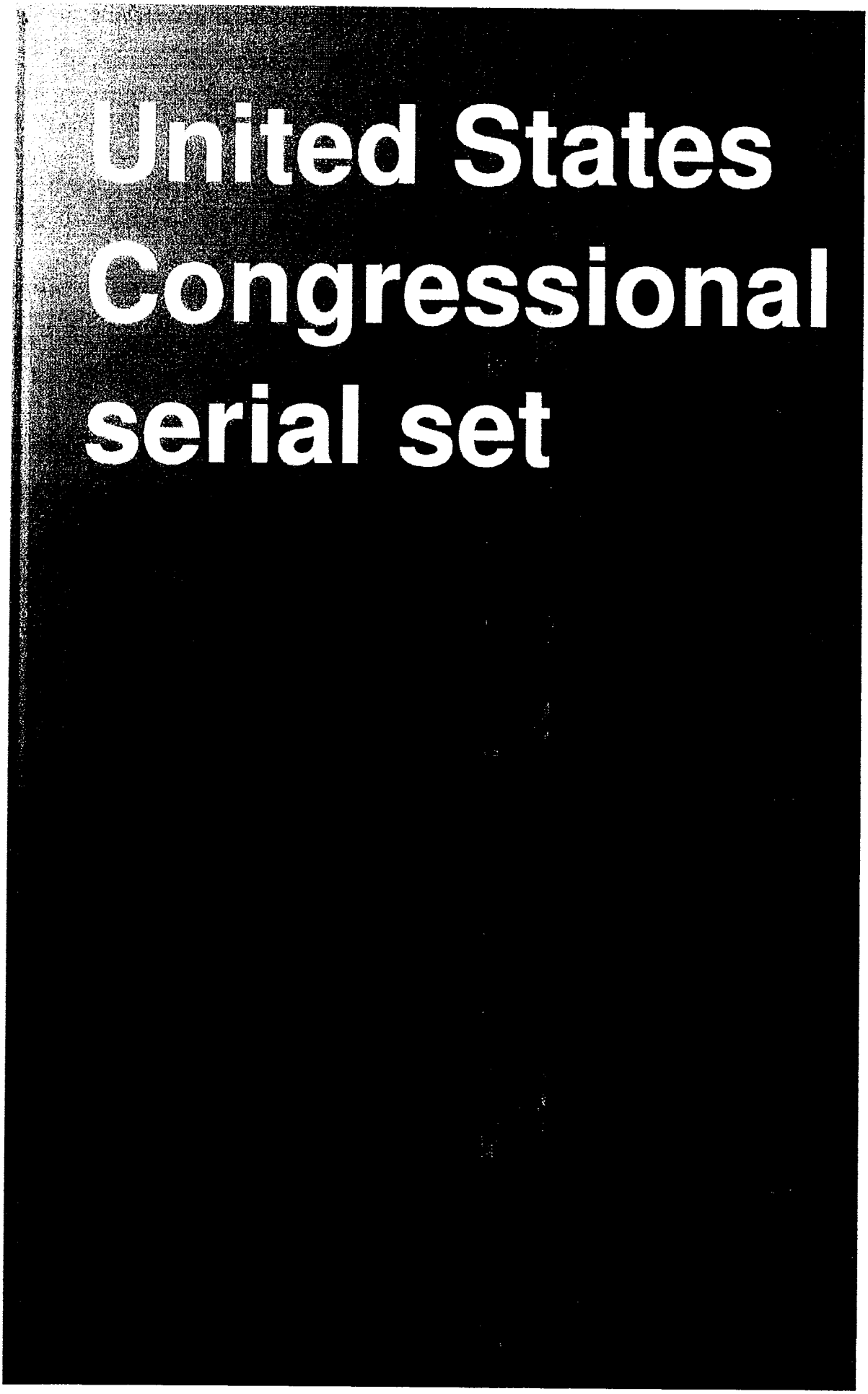
Original condition.—There was no distinct channel in the harbor, the available depth over the flats to the wharves being less than 4 feet at mean low water. A 6-foot channel had been dredged at private expense before the United States assumed charge of the improvement, but it had shoaled again to about 5 feet.

Previous projects.—None.

Existing project.—This provides for a channel about 1 mile long from Raritan Bay to the steamboat dock at Keyport, the width to be 200 feet and the depth to be 8 feet at mean low water. The mean range of tides is 4.9 feet. High easterly or westerly winds cause the tides to fluctuate from 1 to 2 feet above or below the mean range. The estimate of cost for new work, made in 1883, is $40,475. The latest (1917) approved estimate for annual cost of maintenance is $5,000. The project was adopted by the river and harbor act approved August 2, 1882 (H. Doc. No. 153, 42d Cong., 3d sess., and Annual Report for 1873, p. 941). The latest published map is printed in the Annual Report for 1905, page 1040.

[1] Not deducting receipts from sales, etc.

Exhibit R


United States
Congressional
serial set

59TH CONGRESS : : 2D SESSION

DECEMBER 3, 1906-MARCH 4, 1907

HOUSE DOCUMENTS

IN 112 VOLUMES

VOL. 48

WASHINGTON : : GOVERNMENT PRINTING OFFICE : : 1907

59TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { DOCUMENT No. 195.

PROPOSALS FOR MATERIALS AND LABOR IN CONNECTION WITH WORK UNDER ENGINEER DEPARTMENT.

LETTER

FROM

THE SECRETARY OF WAR,

SUBMITTING

ABSTRACTS OF PROPOSALS RECEIVED DURING THE FISCAL YEAR ENDING JUNE 30, 1906, FOR MATERIALS AND LABOR IN CONNECTION WITH WORKS UNDER THE ENGINEER DEPARTMENT.

DECEMBER 5, 1906.—Referred to the Committee on Rivers and Harbors and ordered to be printed.

WAR DEPARTMENT,
Washington, December 5, 1906.

SIR: Pursuant to the provisions of section 230 of the Revised Statutes, which provides that—

> Whenever the Secretary of War invites proposals for any works, or for any materials or labor for any work, he shall report to Congress, at its next session, all bids therefor, with the names of the bidders—

I have the honor to transmit herewith a letter from the Acting Chief of Engineers, United States Army, dated 1st instant, together with abstracts of proposals received during the fiscal year ending June 30, 1906, for materials and labor in connection with works under the Engineer Department.

Very respectfully,

WM. H. TAFT,
Secretary of War.

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

Abstract of proposals for repairing United States Government jetties at Cheesequake Creek, New Jersey, received in response to circular notice dated February 21, 1906, by Col. W. R. Livermore, Corps of Engineers.

[Amount available, about $1,000.]

Name and address of bidder.	Price per ton of 2,000 pounds.	Number of tons that can be furnished and placed at price bid.
Brown & Fleming Contracting Co., 129 Broad street, New York, N. Y.	$1.50	666
Bouker Contracting Co., 21 State street, New York, N. Y.[a]	1.40	714

[a] Lowest and accepted bid. Contract entered into March 26, 1906.

Abstract of proposals for repairing the United States Government dike at Manasquan Inlet, New Jersey, received in response to circular notice dated December 15, 1904, by Col. W. R. Livermore, Corps of Engineers.

[Amount available, $300.]

Name and address of bidder.	Price bid per 1,000 feet B. M.
W. K. Blodgett, Point Pleasant, N. J	$164
Joseph Stillwell, Mantoloking, N. J.[a]	56

[a] Lowest and accepted bid. Emergency contract entered into on July 25, 1905, for putting in place about 4,250 feet of timber and lumber, board measure.

Abstract of proposals for dredging in Shrewsbury River, New Jersey, received in response to advertisement dated October 2, 1905, and opened at New York, N. Y., on October 17, 1905, by Col. W. R. Livermore, Corps of Engineers.

[Amount available, about $16,000.]

Name and address of bidder.	Price per cubic yard, scow measurement.	Amount of material that can be removed at price bid.
	Cents.	*Cubic yards.*
J. Marvin Briggs, 17 Battery place, New York, N. Y.[a]	2	56,250

[a] Rejected.

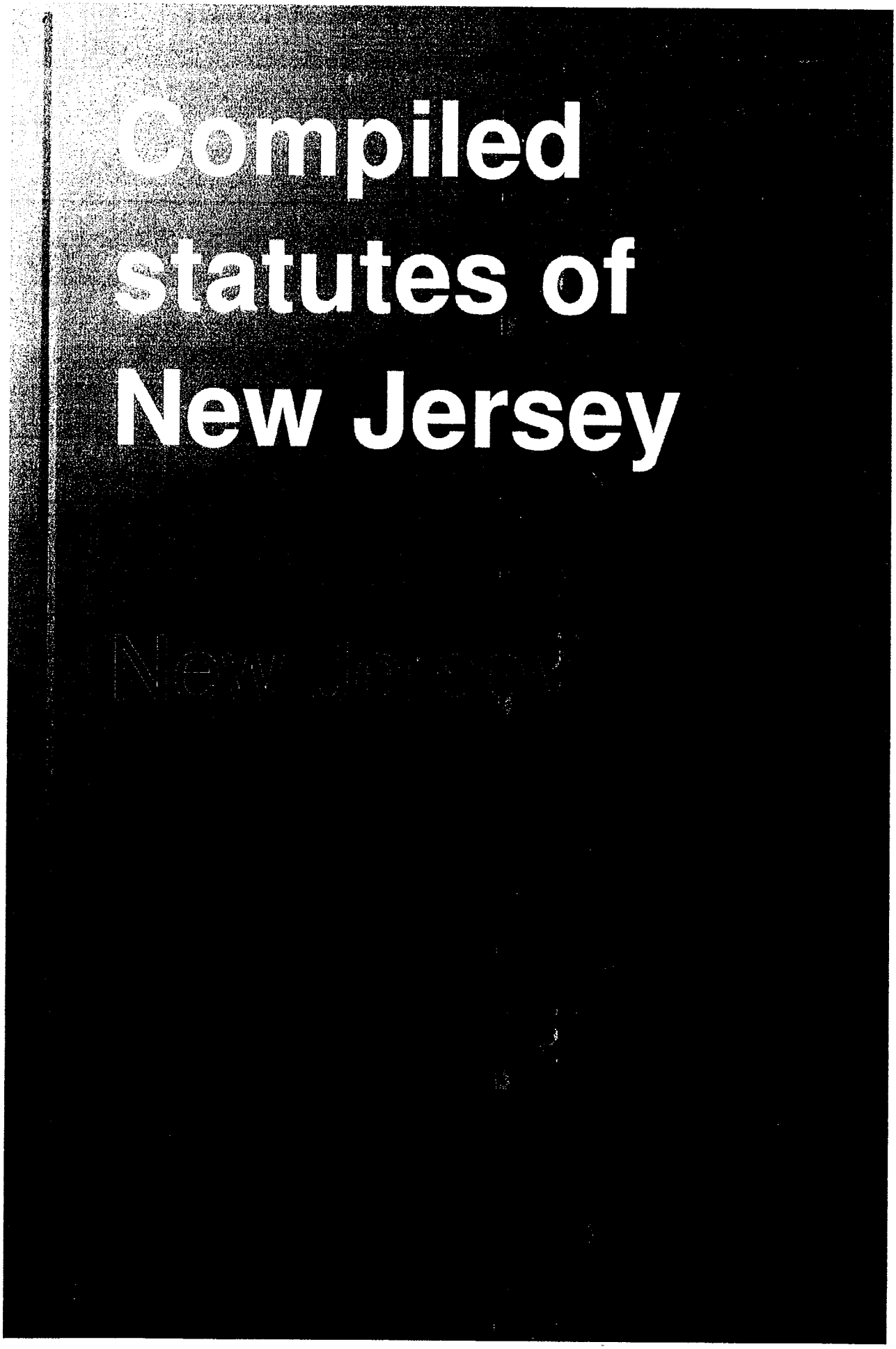
Abstract of proposals for dredging in Shrewsbury River, New Jersey, received in response to advertisement dated November 13, 1905, and opened at New York, N. Y., on November 28, 1905, by Col. W. R. Livermore, Corps of Engineers.

[Amount available, about $16,000.]

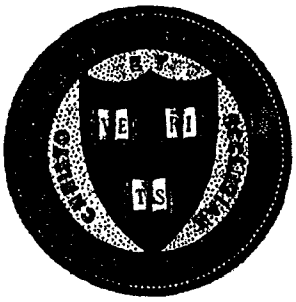
Name and address of bidder.	Price per cubic yard, scow measurement.	Amount of material that can be removed at price bid.
	Cents.	*Cubic yards.*
J. Marvin Briggs, 17 Battery place, New York, N. Y.	38	42,105
Michael H. Flannery, 120 Liberty street, New York, N. Y.[a]	28	57,142

[a] Lowest and accepted bid. Contract entered into on December 16, 1905.

Exhibit S


Compiled
statutes of
New Jersey

[redacted]



thirteen hundred dollars per annum, and which shall be paid in equal monthly payments. (P. L. 1905, p. 483.)

196. Oyster commissioners; number.—Sec. 4. Hereafter the oyster commission shall consist of four members instead of three, whose qualifications for office, appointment, compensation, salary and duties shall be the same in all respects as is provided in the act to which this act is a supplement. (P. L. 1905, p. 483.)

197. Oyster commissioners; quorum; term.—Sec. 5. Three members of said oyster commission shall constitute a quorum at any meeting thereof, and any official act shall be valid which has been authorized by a majority of the commissioners at any stated or special meeting thereof. The oyster commissioners shall hereafter each be appointed for a term of three years, and the four members now constituting the oyster commission shall continue to hold office during the term and time for which they have been respectively appointed. (P. L. 1905, p. 483.)

198. Act for protection of oysters extended to Raritan bay and Cheesequake creek.—Sec. 1. The provisions of the act to which this act is a supplement, and also the provisions of an act entitled "An act for the better regulation and control of the taking, planting and cultivating of oysters on lands lying under the tidal waters of the Delaware bay and Maurice River cove, in the state of New Jersey," approved March twenty-fourth, one thousand eight hundred and ninety-nine, be and the same hereby are extended to certain lands lying under the tidal waters of Raritan bay and Cheesequake creek, in the state of New Jersey, to wit: lands comprehended by the following lines: Beginning at the watch-house at Canaskonk point, on the shore of Raritan bay; thence, in a straight line, to the government buoy, known as East Point buoy; thence on a true course west southwest to the south side of the boundary beacon; thence, on a true course west northwest, to the south side of the Great Beds light; thence to Conover's point on the shore of Raritan bay; thence along the shore line to Cheesequake creek, including all of Cheesequake creek and its tributaries, Travis creek and Flat creek; thence from the government jetty at Cheesequake creek along the shore line to the place of beginning. (P. L. 1907, p. 186.)

IV. ACTS FOR PRESERVATION AND PROPAGATION OF CLAMS AND OYSTERS IN SHARK RIVER

An Act for the regulation, protection and control of the planting, cultivating and the gathering or taking of oysters and clams on lands covered with water in Shark river, in the county of Monmouth.

(P. L. 1905, p. 27.)

199. Shark river oyster and clam district; oyster and clam commissioner; qualifications; appointment; oath; bond; term.—Sec. 1. All the lands of the state of New Jersey covered with water in Shark river, in the county of Monmouth, within the following boundaries, to wit: Beginning at low-water mark at Pearch point, in the township of Neptune, in said county; thence running in a straight line to Beckey's (or Buckey's) point, in the township of Wall, in said county; thence up the shores at low-water mark (crossing the mouths of all brooks that empty into said river) as high up the said river as the tide flows, or as may be deemed suitable to the growth of oysters and clams; thence beginning again at low-water mark at Pearch point, in the township of Neptune aforesaid, and running thence in a straight line to Beckey's (or Buckey's) point, in the township of Wall aforesaid; thence down the shores at low water and on a line with the east end of what was formerly known as James W. White's dwelling-house; thence northerly and on a straight line to a stake standing at low-water mark on the west side of Long point, opposite Yellow Bank, in the township of Neptune; thence up the shore of said river at low-water mark to the beginning;

Exhibit T

Annual Report
Fiscal Year 2011

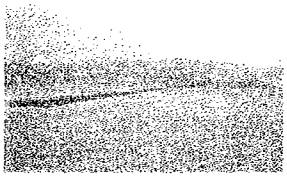
Of the Secretary of the Army
On Civil Works Activities
(1 October 2010 – 30 September 2011)

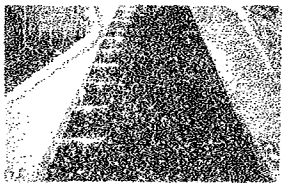
TABLE 2-G **OTHER AUTHORIZED NAVIGATION PROJECTS**

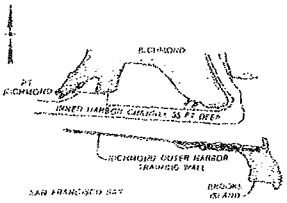
	For Last Full Report See Annual Projects Report for	Cost to September 30, 2011	
		Construction	Operation & Maintenance
Bay Ridge-Red Hook Channels, NY	1992	5,523,297	41,200,035
Bronx River, NY	1991	1,149,946 [3]	3,802,517
Browns Creek, NY	1995	33,976 [12]	1,072,040
Burlington Harbor, VT	1966	706,414 [9]	303,555
Channel between North & South Hero Islands, VT	1909	31,000	1,288
Cheesequake Creek, NJ	1953	40,000	210,675
Coney Island Channel, NY	1973	111,371	423,148
Coney Island Creek, NY	1952	69,489	6,203
East River, NY	1997	32,723,662 [13]	8,225,184
East Rockaway Inlet, NY	1997	83,969	16,624,362
Echo Bay Harbor, NY	1953	64,584	21,571
Fire Island Inlet, NY	1973	594,355	2,908,786
Flushing Bay & Creek, NY	1997	2,102,905	8,878,900
Gordon's Landing, VT	1982	34,750	115
Gowanus Creek Channel, NY	1972	346,831	394,004
Great Chazy River, NY	1980	18,000	292,919
Great Kills Harbor, NY	1962	137,301 [1]	88,029
Great Lakes to Hudson River W/W, NY	1976	33,562,640 [20]	457
Greenport Harbor, NY	1953	74,681	21,720
Harlem River, NY	1969	3,616,119	493,491
Hempstead Harbor, NY	1993	3,687,949	76,497
Hudson River Channel, NY	1997	6,771,870	37,136,037
Huntington Harbor, NY	1953	91,081 [17]	57,527
Keyport Harbor, NJ	1990	40,475	1,417,437
Lake Montauk, NY	1991	791,680	1,288,163
Larchmont Harbor, NY	1970	76,065	267,768
Little Neck Bay, NY	1969	1,741,210 [19]	537
Mamaroreck Harbor, NY	1990	513,764	1,351,086
Matawan Creek, NJ	1984	21,000	315,613
Mattituck Harbor, NY	1990	177,925	1,417,832
Milton Harbor, NY	1984	151,373	1,057,26
Newton Creek, NY	1986	1,168,354	1,760,745
New Rochelle Harbor, NY	1971	73,214 8	212,411
New York State Barge Canal, NY	1988	—	—
Northport Harbor, NY	1956	78,644	61,487
Peconic River, NY	1953	25,000	116,500
Peekskill Harbor, NY	1951	19,400	66,037
Plattsburgh Harbor, NY	1986	198,415	256,415
Port Chester Harbor, NY	1990	433,470 [6]	1,742,097
Port Henry Harbor, NY	1931	69,406 [25]	1,299
Port Jefferson Harbor, NY	1977	221,128 [31]	359,294
Raritan River, NJ	1991	1,551,470	16,114,463
Raritan River to Arthur Kill Cut-Off Channel, NJ	1991	810,500	3,965,631

Exhibit U

US Army Corps of Engineers







HYDRAULICS LABORATORY

[redacted]

IMPROVEMENT OF OPERATIONS AND MAINTENANCE TECHNIQUES RESEARCH PROGRAM

TECHNICAL REPORT HL-88-20

INVENTORY OF TRAINING STRUCTURES IN ESTUARIES

by

Walter Pankow, Michael J. Trawle

Hydraulics Laboratory

DEPARTMENT OF THE ARMY
Waterways Experiment Station, Corps of Engineers
PO Box 631, Vicksburg, Mississippi 39180-0631

August 1988
Final Report

Prepared for DEPARTMENT OF THE ARMY
US Army Corps of Engineers
Washington, DC 20314-1000
Under IOMT Work Unit No. 32350

Destroy this report when no longer needed. Do not return it to the originator.

The findings in this report are not to be construed as an official Department of the Army position unless so designated by other authorized documents.

The contents of this report are not to be used for advertising, publication, or promotional purposes. Citation of trade names does not constitute an official endorsement or approval of the use of such commercial products.

Unclassified
SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION: Unclassified	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT: Approved for public release; distribution unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S): Technical Report HL-88-20	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION: USAEWES Hydraulics Laboratory; 6b. OFFICE SYMBOL (If applicable): WESHE-P	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code): PO Box 631 Vicksburg, MS 39180-0631	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING/SPONSORING ORGANIZATION: US Army Corps of Engineers; 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code): Washington, DC 20314-1000	10. SOURCE OF FUNDING NUMBERS: See reverse PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification): Inventory of Training Structures in Estuaries

12. PERSONAL AUTHOR(S): Pankow, Walter; Trawle, Michael J.

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final report	FROM _____ TO _____	August 1988	108

16. SUPPLEMENTARY NOTATION: Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Dike, Jetty, Estuary, Training structures, Inventory

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

This report inventories training structures in estuaries. The ultimate goal of the research is to improve design guidance for the effective use of training structures in estuaries. This inventory is the result of literature and map surveys to determine what structures exist in the estuaries and is the first of three planned stages of research.

Several structures will be selected for further detailed data retrieval. The structures will then be modelled in both a physical model (flume) and a numerical model. The resulting product will be a numerical method verified by prototype and physical model data to assist during the design stage for estuarine training structures. The method will also aid engineers in determining the effectiveness of existing structures.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT: ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION: Unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE (Include Area Code) / 22c. OFFICE SYMBOL

DD Form 1473, JUN 86 — Previous editions are obsolete. — SECURITY CLASSIFICATION OF THIS PAGE

Unclassified

Unclassified
SECURITY CLASSIFICATION OF THIS PAGE

10. WORK UNIT ACCESSION NO. (Continued).

Funding provided by Improvement of Operations and Maintenance Techniques research program, Work Unit No. 32350, sponsored by the Headquarters, US Army Corps of Engineers.

Unclassified
SECURITY CLASSIFICATION OF THIS PAGE

PREFACE

A survey of US Army Corps of Engineers project maps was conducted and this inventory compiled by personnel of the Estuaries Division, Hydraulics Laboratory (HL), of the US Army Engineer Waterways Experiment Station (WES), under the Improvement of Operations and Maintenance Techniques (IOMT) research program sponsored by the Headquarters, US Army Corps of Engineers (USACE), under IOMT Work Unit No. 32350, "Estuarine Channel Maintenance by Training Structures." Additional funding was provided by the Repair, Evaluation, Maintenance, and Rehabilitation (REMR) research program, under REMR Work Unit No. 32323, "Scour Detection and Repair."

The survey was conducted by Messrs. Walter Pankow and Michael J. Trawle, under the general supervision of Messrs. Frank A. Herrmann, Jr., Chief, HL; Richard A. Sager, Assistant Chief, HL; William H. McAnally, Jr., Chief, Estuaries Division; and E. Clark McNair, Jr., IOMT Program Manager. Messrs. Jim Gottesman and Charles Hummer were USACE Technical Monitors. This report was edited by Mrs. Marsha Gay, Information Technology Laboratory, WES.

COL Dwayne G. Lee, CE, is the Commander and Director of WES. Dr. Robert W. Whalin is the Technical Director.

CONTENTS

CONVERSION FACTORS, NON-SI TO SI (METRIC)
UNITS OF MEASUREMENT

Non-SI units of measurement used in this report can be converted to SI (metric) units as follows:

Multiply	By	To Obtain
feet	0.3048	metres
miles (US statute)	1.609347	kilometres

INVENTORY OF TRAINING STRUCTURES IN ESTUARIES

PART I: INTRODUCTION

Background

1. Over 550 training structures constructed and maintained by the US Army Corps of Engineers exist in estuaries of the contiguous United States. The primary purpose of these structures is to minimize maintenance dredging requirements in federally maintained navigation projects. In general, the structures are included within overall navigation projects and not noted separately. In order to inventory specific training structures, a review of estuarine navigation project maps was conducted. This inventory is the result of that research.

2. These structures could be categorized in a variety of ways; but for the purpose of this report, each training structure has been assigned to one of four categories: lateral dikes, longitudinal dikes, barrier dikes, and jetties.

a. Lateral dikes are defined as structures that are generally aligned transverse to the flow. This type of structure is usually designed to constrict flow within a smaller cross-sectional area, thus increasing current velocities in critical channel reaches. This type of structure often also has a secondary role, that of bank protection.

b. Longitudinal dikes are defined as structures that are generally aligned parallel to the flow. This type of structure works in critical channel reaches by causing a flow redistribution of sufficient magnitude to significantly increase channel velocities. Usually the structures tend to align or concentrate the flow along the navigation channel.

c. Barrier dikes are defined as structures that are placed to eliminate the migration of sediment from adjacent areas into navigation channels. This type of dike is not designed to increase channel velocities but to isolate the channel from a sediment source.

d. Jetties are defined as structures placed at the entrance of harbors or waterways within an estuary for the purpose of reducing entrance channel shoaling. Note that this category includes only jetties located wholly within the estuary and not coastal jetties located at the mouth of an estuary.

Objective

3. The overall objective of this investigation is to improve existing design guidance and develop new design guidance for the use of training structures in estuaries to reduce shoaling in navigation channels and basins.

4. The objective of this report is to identify, describe, and categorize the existing estuarine training structures. This inventory will provide the basis for the more detailed evaluation on the effectiveness of selected structures in reducing maintenance dredging requirements, to be documented in future reports.

Approach

5. The overall investigation consists of three tasks. The first task consists of identifying and classifying the existing estuarine training structures. The second task is to determine past and present design techniques for training structures and assess existing structure performance in specific cases. The third task will assess the applicability of modeling techniques, both physical and numerical, to estuarine training structure design and use appropriate testing to develop improved design guidance.

PART II: LISTING AND CLASSIFICATION OF STRUCTURES

6. This listing provides locations and classifications of estuarine training structures within the US Army Corps of Engineers Divisions and Districts. (No estuarine training structures were identified within the Los Angeles District nor the Pacific Ocean Division.) The information given with each structure is the District Project Map description, the approximate location, and the classification based on the four categories described in Part I of this report: lateral dike, longitudinal dike, jetty, or barrier dike.

(Note: The alphanumeric designation in parentheses under the Approximate Location column corresponds to the site designation included in Part III of this inventory.)

Estuary	Project Map Description	Approximate Location	Classification*
		New England Division	
Kennebec River Estuary, Maine	Beef Rock Training Wall	Mile 23 (1a.1)	Longitudinal dike
	Training wall	Mile 31 (1a.2)	Lateral dike
	Jetties	Richmond Harbor (1a.3)	Lateral dikes (2)
Royal River, Maine	Jetty	Mile 1 (1b)	Lateral dike
Saco River, Maine	Entrance jetty	Mile 0 (1c.1)	Jetty
	Chase Point jetty	Mile 3 (1c.2)	Lateral dike
	Junkins Point jetties	Mile 5 (1c.3)	Lateral dikes (2)
Massachusetts Bay, Mass.	Jetties	Scituate Bay (1d)	Jetties (2)
Cape Cod Bay, Mass.	Long Beach Dike	Plymouth Harbor (1e)	Longitudinal dike
Westport River, Mass.	Longitudinal training dike	Lions Tongue, Great Flat (1f)	Longitudinal dike

* Numbers in parentheses indicate number of structures at location.

(Continued)

Estuary	Project Map Description	Approximate Location	Classification
	New England Division (Continued)		
Thames River, Conn.	Mohegan Dike	Mile 9 (1g.1)	Longitudinal dike
	Trading Cove Dike	Mile 9.5 (1g.2)	Longitudinal dike
	Long Rock Dike	Mile 10 (1g.3)	Longitudinal dike
	Rolling Mill Dike	Mile 10 (1g.4)	Longitudinal dike
	Norwich Dike	Mile 10.5 (1g.5)	Longitudinal dike
Connecticut River below Hartford, Conn.	Hartford Training Wall	Mile 51 (1h.1)	Longitudinal dike
	Dikes	Mile 43 (1h.2)	Lateral dikes (8)
	Dikes	Mile 45 (1h.2)	Lateral dikes (5)
	Hurdles	Mile 45 (1h.2)	Lateral dikes (6)
	Dikes	Mile 46 (1h.2)	Lateral dikes (8)
	Hurdles	Mile 47 (1h.2)	Lateral dikes (4)
	Dikes	Mile 48 (1h.2)	Lateral dikes (8)
	Dike	Mile 49 (1h.2)	Longitudinal dike
	Hurdles	Mile 49 (1h.2)	Lateral dikes (4)
	Glastonbury Wing Dam	Mile 42 (1h.3)	Longitudinal dike
	Submerged dike	Mile 36 (1h.4)	Lateral dike
	Portland Bar Dike	Mile 33 (1h.5)	Lateral dike
	Sears Shoal Dike	Mile 24.5 (1h.6)	Longitudinal dike
New Haven Harbor, Conn.	Pile and riprap dike	Mile 3 (1i)	Longitudinal dike

(Continued)

Estuary	Project Map Description	Approximate Location	Classification
	New England Division (Continued)		
Milford Harbor, Conn.	Jetties	Mouth of Wepawaug River (1j)	Jetties
Housatonic River, Conn.	Dike	Mile 2 (1k.1)	Longitudinal dike
	Jetty	Mile 13 (1k.2)	Lateral dike
Southport Harbor, Conn.	Dike	Mill River (1l)	Longitudinal dike
Bullocks Point Cove, R. I.	Dike and jetty	Mouth of Bullocks Point Cove (1m)	Jetty
	North Atlantic Division		
New York District			
Flushing Bay and Creek, N. Y.	US Dike	Proximity of LaGuardia Airport, Long Island (2a)	Longitudinal dike
Browns Creek, Great South Bay, N. Y.	Jetties	Mouth (2b)	Jetties (2)
Hudson River, N. Y.	Dike	Near mile 1, Wappinger Creek (2c.1)	Longitudinal dike
	Dikes	Mouth of Esopus Creek (2c.2)	Jetties (2)
	Dikes	Mouth and entrance of Rondout Harbor (2c.2)	Jetties (2)
	Fordham Point Dike	Mile 122 (2c.3)	Longitudinal dike
	Stuyvestant Island Dike	Mile 127 (2c.4)	Longitudinal dike
	Bronks Dike	Mile 128 (2c.5)	Longitudinal dike
	New Baltimore Dike	Mile 131 (2c.6)	Longitudinal dike
	Mulls Island Half Dike	Mile 132 (2c.7)	Longitudinal dike
	Mulls Platt Half Dike	Mile 132 (2c.8)	Longitudinal dike

(Continued)

Estuary	Project Map Description	Approximate Location	Classification
	North Atlantic Division (Continued)		
New York District (Cont'd)			
Hudson River, N. Y. (Cont'd)	Coeymans Middle Dike	Mile 132 (2c.9)	Longitudinal dike
	Mulls Timber Dike	Mile 134 (2c.10)	Longitudinal dike
	New York State-maintained dike (Castleton dike)**	Mile 136 (2c.11)	Longitudinal dike
	Cedar Hill Dike	Mile 136 (2c.12)	Longitudinal dike
	Cow Island Dike	Opposite the previous dike (2c.13)	Longitudinal dike
	Winnies Dike	Mile 138 (2c.14)	Longitudinal dike
	Campbell Island Dike	Opposite the previous dike (2c.15)	Longitudinal dike
	Van Wies Dike	Mile 139 (2c.16)	Longitudinal dike
	Overslaugh Dike No. 2	Mile 140 (2c.17)	Longitudinal dike
	Beacon Island Dike	Mile 141 (2c.18)	Longitudinal dike
	Overslaugh Dike No. 1	Mile 141 (2c.19)	Longitudinal dike
	Papscanee Dike	Mile 141 (2c.20)	Longitudinal dike
	Bogart Island Dike	Mile 142 (2c.21)	Longitudinal dike
	Lower Patroon Island Dike	Mile 146 (2c.22)	Longitudinal dike
	Upper Patroon Island Dike	Mile 147 (2c.23)	Longitudinal dike
	Base Island Dike	Mile 147 (2c.24)	Longitudinal dike

(Continued)

** Not included in the inventory but listed for clarity.

Estuary	Project Map Description	Approximate Location	Classification
	North Atlantic Divison (Continued)		
New York District (Cont'd)			
Hudson River, N. Y. (Cont'd)	High Dike	Mile 147 (2c.25)	Longitudinal dike
	Breaker Island Dike	Mile 148 (2c.26)	Longitudinal dike
	Port Schuyler Dike	Mile 149 (2c.27)	Longitudinal dike
New York and New Jersey channels	US Dike	Mile 24 (2d)	Longitudinal dike
Raritan River, N. J.	US Dike	Mile 5 (2e)	Longitudinal dike
Cheesequake Creek, N. J.	Jetties	Mouth (2f)	Jetties (2)
	Dike	Mouth (2f)	Longitudinal dike
Shoal Harbor and Compton Creek, N. J.	Dike	Mouth (2g)	Longitudinal dike
Sandy Hook Bay, N. J.	Jetty	Small boat harbor entrance (2h)	Jetty
Shrewsbury River, N. J.	Dike	Barley Point near Normandie (2i)	Longitudinal dike
Philadelphia District			
Wilmington Harbor, Del.	Jetties	Mouths of the Christina and Brandywine Rivers (3a)	Jetties (3)
Inland Waterway, Delaware River to Chesapeake Bay, C & D Canal, Del.	Jetties	Delaware River entrance (3b)	Jetties (2)
Smyrna River, Del.	Jetties	Mouth (3c)	Jetties (2)
Mispillion River, Del.	Jetties	Mouth (3e)	Jetties (2)

(Continued)

Estuary	Project Map Description	Approximate Location	Classification
	North Atlantic Division (Continued)		
Philadelphia District (Cont'd)			
Inland Waterway, Rehoboth Bay to Delaware Bay, Del.	Jetties	Entrances at Rehoboth and Delaware Bays (3f)	Jetties (4)
Mantua Creek, N. J.	Jetties	Mouth (3g)	Jetties (2)
Raccoon Creek, N. J.	Jetty	Mouth (3h)	Jetty
Goshen Creek, N. J.	Jetties	Mouth (3i)	Jetties (2)
Neshaminy State Park Harbor, Pa.	Jetty	Entrance (3j)	Jetty
Delaware River, Philadelphia, Pa., to the sea	Fisher Point Dike	Petty Island (Camden, N. J.) (3k.1)	Longitudinal dike
	Howell Cove Dike	Near Big Timber Creek (N. J.) (3k.2)	Longitudinal dike
	Mifflin Bar Dike	Near airport (Philadelphia, Pa.) (3k.3)	Longitudinal dike
	Chester Island Dike	Chester Island (3k.4)	Lateral dike
	Oldmans Point Dike	North of Pennsgrove, N. J. (3k.5)	Lateral dike
	Pennsville Dike	South of Twin Delaware Memorial Bridges (3k.6)	Longitudinal dike
	Pea Patch Island Dike	Pea Patch Island (3k.7)	Longitudinal dike
	Bulkhead Bar Dike	East of the Pea Patch Island Dike (3k.8)	Longitudinal dike
	Killcohook Dike	East of the Pea Patch Island Dike (3k.9)	Longitudinal dike
	Reedy Island Dike	Reedy Island (3k.10)	Longitudinal dike
	Alloway Creek Dike	Alloway Creek, N. J. (3k.11)	Lateral dike

(Continued)

Estuary	Project Map Description	Approximate Location	Classification
	North Atlantic Division (Continued)		
Philadelphia District (Cont'd)			
Delaware River, Philadelphia, Pa., to the sea (Cont'd)	Stony Point Dike	South of Alloway Creek, N. J. (3k.12)	Longitudinal dike
	Hope Creek Dike	Below Stony Point (3k.13)	Lateral dike
Double Creek, N. J.	Jetty	Barnegat Bay entrance (31)	Jetty
New Jersey Intracoastal Waterway, Cape May Canal	Jetties	Cape May Canal entrance (3m)	Jetties (2)
Baltimore District			
Claiborne Harbor, Md.	Jetty	Eastern Bay (4b)	Jetty
Bivalve, Md.	Jetties	Nanticoke River (4c)	Jetties (2)
Nanticoke, Md.	Jetties	Nanticoke River (4d)	Jetties (2)
Twitch Cove and Big Thorofare River, Md.	Jetties	Smith Island, east Chesapeake Bay (4e)	Jetties (2)
Fishing Creek, Chesapeake Beach, Md.	Jetties	Chesapeake Beach (4g)	Jetties (2)
Back Creek, Md.	Jetty	Eastport (Chesapeake Bay) (4j)	Jetty
Herring Creek, Md.	Jetties	Tall Timbers (Potomac River) (4k)	Jetties (2)
Little Wicomico River, Va.	Jetties	Potomac River and Chesapeake Bay (41)	Jetties (2)
Bonum Creek, Va.	Jetties	Tucker Hill (Potomac River) Bay (4m)	Jetties (2)
Nomini Creek, Va.	Jetty	Nomini Bay (4n)	Jetty

(Continued)

Estuary	Project Map Description	Approximate Location	Classification
	North Atlantic Division (Continued)		
Norfolk District			
James River, Va.	Spur and training dikes	Between miles 75 and 90 (5a)	Longitudinal and lateral dikes
Rappahannock River, Va.	Dikes (crib and pile, riprap stone)	Between miles 90 and 110 (5b)	Longitudinal and lateral dikes
Carters Creek, Va.	Jetty	Rappahannock River (5d)	Jetty
Urbanna Creek, Va.	Jetties	Rappahannock River (5e)	Jetties (2)
Milford Haven, Va.	Jetty	Hills Bay (5f)	Jetty
York River, Va.	Dike	Mile 32, West Point Bar (5g)	Longitudinal dike
Little River (Creek), Va.	Jetties	Norfolk and Virginia Beach (5h)	Jetties (2)
Tylers Beach, Va.	Jetties	Burwells Bay (5i)	Jetties (2)
Cape Charles City Harbor, Va.	Jetty	Chesapeake Bay (5k)	Jetty
Appomattox River, Va.	Levee	About 1 mile east of dam at Petersburg (5l)	Barrier dike
	South Atlantic Division		
Wilmington District			
Silver Lake Harbor, N. C.	Training wall	On Ocracoke Island (6a)	Jetty
Cedar Island Bay, N. C.	Jetties	Cedar Island Refuge (6b)	Jetties (2)
Beaufort Harbor, N. C.	Training wall	South tip of Radio Island (6c)	Longitudinal dike

(Continued)

Estuary	Project Map Description	Approximate Location	Classification
	South Atlantic Division (Continued)		
Charleston District			
Charleston Harbor, S. C.	Dikes	Cooper River north of Drum Island (7a)	Lateral dikes (2)
Georgetown Harbor, S. C.	Training wall	Winyah Bay (7b)	Longitudinal dike
Savannah District			
Savannah Harbor, Ga.	Tide gate	Savannah River (8a)	Barrier dike
Brunswick Harbor, Ga.	Jetty	Brunswick River (8b)	Jetty
Savannah River, Ga.	Dikes	Miles 27.5 and 30.5 (8c)	Longitudinal and lateral dikes (?)
Jacksonville District			
Jacksonville Harbor, Fla.	Training walls	St. Johns River (9a)	Longitudinal dikes (7)
Coral Gables Waterway, Miami Harbor, Fla.	Jetty	Biscayne Bay (9b)	Jetty
Mobile District			
Fly Creek, Fairhope, Ala.	Jetties	Fly Creek and Mobile Bay (10a)	Jetties (2)
Dauphin Island Bay, Ala.	Jetty	Dauphin Island in Mobile Bay (10b)	Jetty
	Lower Mississippi Valley Division		
New Orleans District			
Mississippi River, La.	Sills	Head of Passes region (11a)	Barrier dikes (2)
	Dikes	North of Head of Passes (11a)	Lateral dikes (4)
	Headland structures	Head of Passes (11a)	Longitudinal dikes (2)

(Continued)

Estuary	Project Map Description	Approximate Location	Classification
Lower Mississippi Valley Division (Continued)			
New Orleans District (Cont'd)			
Mississippi River, La. (Cont'd)	Spur dikes	Southwest Pass (11a)	Lateral dikes (129)
Southwestern Division			
Galveston District			
Port O'Connor, Tex.	Dikes	Matagorda Bay (12a)	Jetties (2)
Texas City Dike, Texas City, Tex.	Dike	Galveston Bay (12d)	Barrier dike
Port Bolivar, Tex.	Dike	Galveston Bay (12e)	Jetty
Trinity Bay (Channel to Liberty near Double Bayou, Tex.)	Earth dam	Channel to Liberty (12f)	Barrier dike
Cedar Bayou, Tex.	Submerged jetties	Near Houston Point in Galveston Bay (12g)	Jetties (2)
South Pacific Division			
San Francisco District			
Napa River, Calif.	Dikes	Mile 0 to mile 16 (13a)	Jetties (2) and lateral dikes
	Dike	Upper San Pablo Bay (13a)	Longitudinal dike
Richmond Harbor, San Francisco Bay, Calif.	Training wall	Outer harbor (13b)	Longitudinal dike
Oakland Harbor, San Francisco Bay, Calif.	Jetties	Inner harbor entrance (13c)	Jetties (2)
Humboldt Harbor and Bay, Calif.	Groin and breakwater	Buhne Point (13d)	Barrier dike
Noyo River and Harbor, Calif.	Jetties and walls	Noyo (13e)	Jetties

(Continued)

Estuary	Project Map Description	Approximate Location	Classification
		North Pacific Division	
Portland District			
Columbia River, Oreg.	Dikes	Oregon Slough, Mile 102 (14a.1)	Lateral dikes (9)
	Dikes	Lower Columbia River, mile 0 to mile 145 (14a.2)	Lateral dikes (165)
Yaquina River near Toledo, Oreg.	Submerged dikes	Miles 11 and 13.5 (14b)	Lateral dikes (2)
Umpqua River, Oreg.	Training jetty	Mouth (14c)	Longitudinal dike
Coos Bay, Oreg.	Dikes	Mile 6 (14d)	Lateral dikes (5)
Baker Bay, Oreg.	Dikes	West of Sand Island (14e)	Lateral dikes (4)
Seattle District			
Swinomish Channel, Wash.	Jetties and dikes	Mouth (15a)	Longitudinal dikes (2), and barrier dikes (4)
Skagit River, Wash.	Training dike	Skagit Bay (15b)	Longitudinal dike
	Closing dikes	Skagit River (15b)	Barrier dikes (6)
Snohomish River, Everett Harbor, Wash.	Training dikes, spur dikes, and pile wall	Everett Harbor (15c)	Longitudinal dikes (3), and lateral dikes (2)
Puyallup River, Tacoma Harbor, Wash.	Training walls	Tacoma Harbor (15d)	Jetties (2)
Quillayute River, Wash.	Dike and training wall	Near mouth (15e)	Longitudinal dikes (2)
Grays Harbor, Point Chehalis, Oreg.	Groins	Point Chehalis (15f)	Lateral dikes (6)

(Continued)

Estuary	Project Map Description	Approximate Location	Classification
	North Pacific Division (Continued)		
Alaska District			
Cordova Harbor, Alaska	Silt barrier	Orca Inlet (16a)	Barrier dike
Dillingham Harbor, Alaska	Submerged rock sill	Bristol Bay (16b)	Barrier dike
Hoonah Harbor, Alaska	Diversion dike	Chichagof Island (16c)	Lateral dike

PART III: BRIEF TRAINING STRUCTURE DESCRIPTIONS

7. In this section, brief descriptions of the training structures listed in Part II are given. Included in the descriptions are characteristics of the structures themselves as well as the hydraulic environment in which they have been constructed. Dimensions of features are included when available from project maps. Each structure is listed according to the District Project Map descriptor, with the classification category following in parentheses. Below each description, the appropriate National Oceanic and Atmospheric Administration, National Ocean Service (NOAA/NOS), Nautical Chart number is given for further reference. Since the initial inventory compilation, several structures and/or locations have been noted as inactive or constructed and maintained by other interests. Because these structures/locations are still listed in some of the project maps, they are also included in this text but are noted as being disqualified from the inventory.

New England Division

8. The New England Division, which is not divided into Districts, has over 60 estuarine training structures within the Division's jurisdiction (US Army Engineer Division, New England, 1980, 1982). The structures include jetties, dikes, and training walls, and the project sites are located in Figure 1.

Kennebec River Estuary, Maine

9. Site 1a.1, Beef Rock Training Wall (longitudinal dike). The Beef Rock Training Wall, a longitudinal wall approximately 4,000 ft* long, is adjacent to the east channel at Swan Island, river mile 23 (Figure 2). The project provides for a navigation channel at Beef Rock Shoal 150 ft wide and 17 ft deep. The mean range of tide is approximately 5.3 ft.

(NOAA Nautical Chart No. 13298)

10. Site 1a.2, training wall (lateral dike). The navigation project includes a training wall north of Sands Island near river mile 31 as indicated

* A table of factors for converting non-SI units of measurement to SI (metric) units is found on page 3.

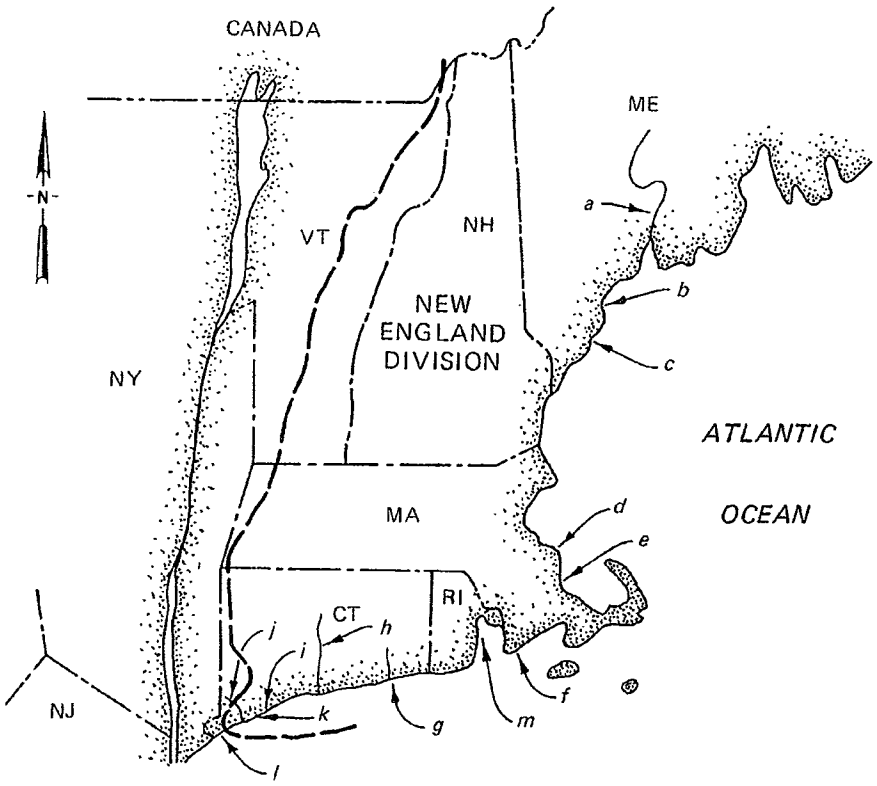


Figure 1. Location Plan 1, New England Division

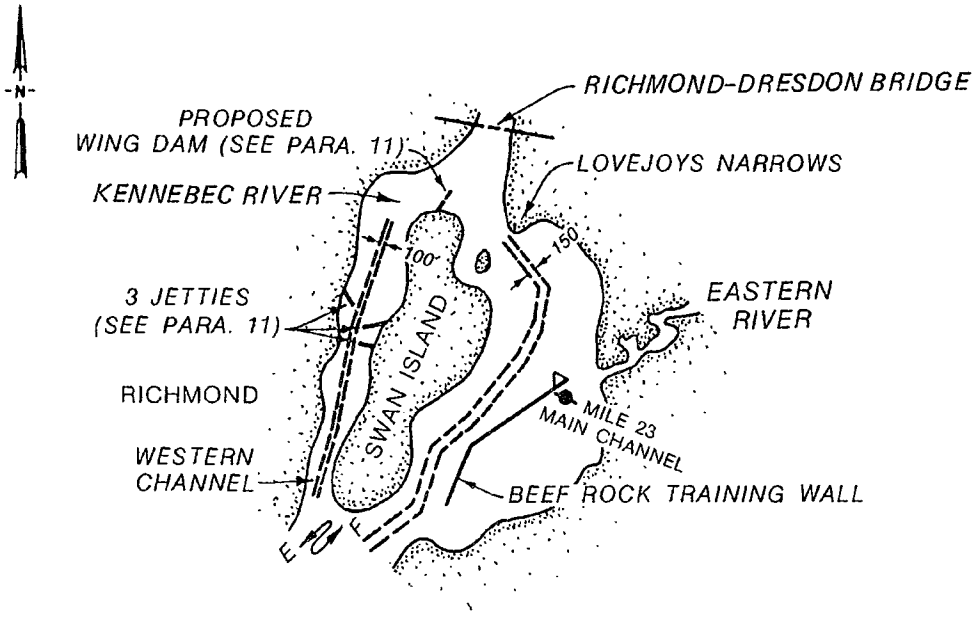


Figure 2. Beef Rock Training Wall and Richmond Harbor structures

in Figure 3. The project provides for a navigation channel that is 150 ft wide and 18 ft deep. The mean range of tide is approximately 5.1 ft.

(NOAA Nautical Chart No. 13298)

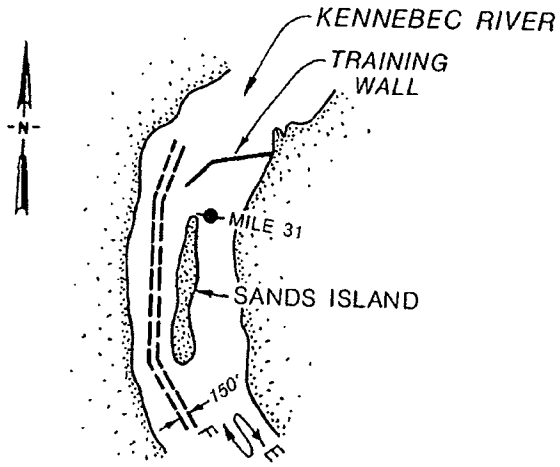


Figure 3. Kennebec River training wall, river mile 31

11. Site 1a.3, jetties (lateral dikes). Three jetties that function as dikes were constructed at Richmond Harbor, Maine, in the western channel of the Kennebec River on the west side of Swan Island (Figure 2). A wing dam was recommended to prevent shoaling at the upper end of Swan Island (Figure 2). However, the western channel was recommended for abandonment in 1917. The project was completed in 1883 and provides for a navigation channel 10 ft deep. The mean range of tide is 5.3 ft.

(NOAA Nautical Chart No. 13298)

Royal River Estuary, Maine

12. Site 1b, jetty (lateral dike). The navigation project includes the construction of a rubblestone jetty, the "Federal jetty," 195 ft long, opposite Wolfe's Point near river mile 1 (Figure 4). The project provides for a navigation channel 100 ft wide and 4.5 ft deep. The mean range of tide is approximately 9 ft.

(NOAA Nautical Chart No. 13292)

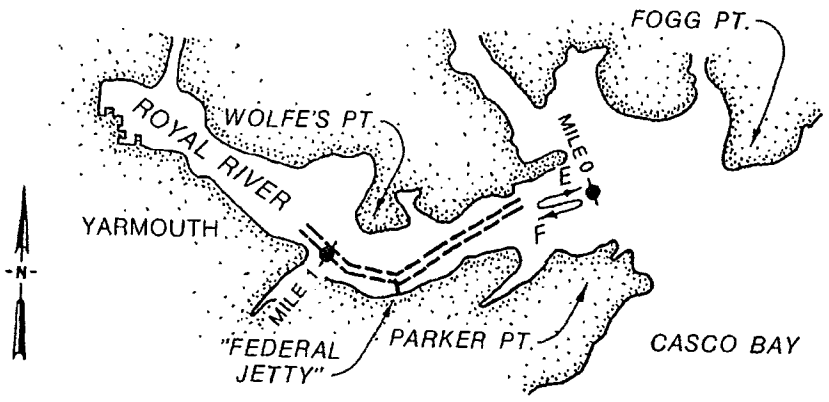


Figure 4. Jetty near Wolfe's Point, Royal River estuary

Saco River Estuary, Maine

13. Several structures were constructed in this estuary, including the following:

a. Site 1c.1, entrance jetty. The jetty is located at the river mouth and projects easterly into Saco Bay (Figure 5). The jetty (south side) is about 4,800 ft long. An approximately parallel breakwater, located on the north side of the channel, is about 6,600 ft long. Also, a short dike protects the landward breakwater connection. The project provides for a navigation channel 8 ft deep and 200 ft wide. The mean range of tide is about 8.8 ft.

b. Site 1c.2, Chase Point jetty (lateral dike). As shown in Figure 5.

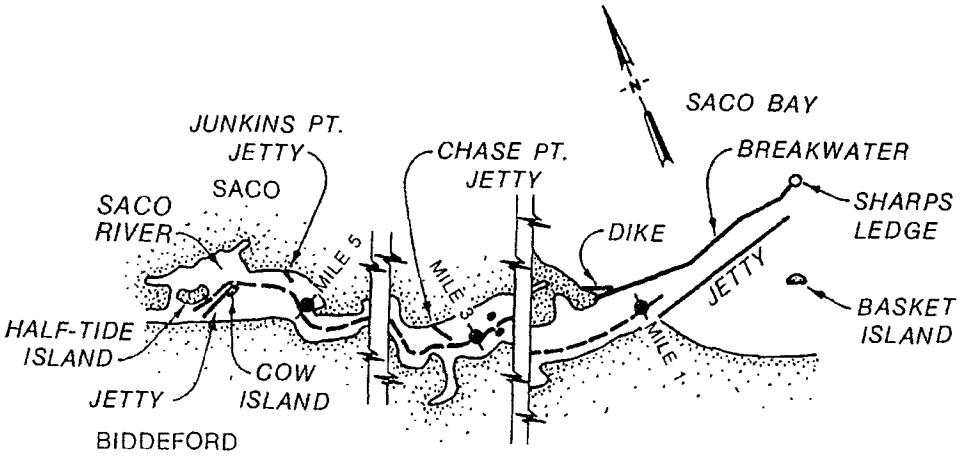


Figure 5. Saco River estuarine jetties

c. Site 1c.3, Junkins Point jetties (lateral dikes). As shown in Figure 5.

(NOAA Nautical Chart No. 13298)

Massachusetts Bay, Massachusetts

14. Site 1d, rubble-mound entrance jetties (jetties). The north rubble-mound jetty projects about 400 ft to the southeast and about 300 ft to the east into Massachusetts Bay (Figure 6). The Commonwealth of Massachusetts constructed a rubble breakwater within the harbor very close to the jetty. The south jetty projects about 300 ft north toward the entrance channel where the navigation channel is 200 ft wide and 12 ft deep. The project was completed in 1959. The mean range of tide is 9.0 ft.

(NOAA Nautical Chart No. 13287)

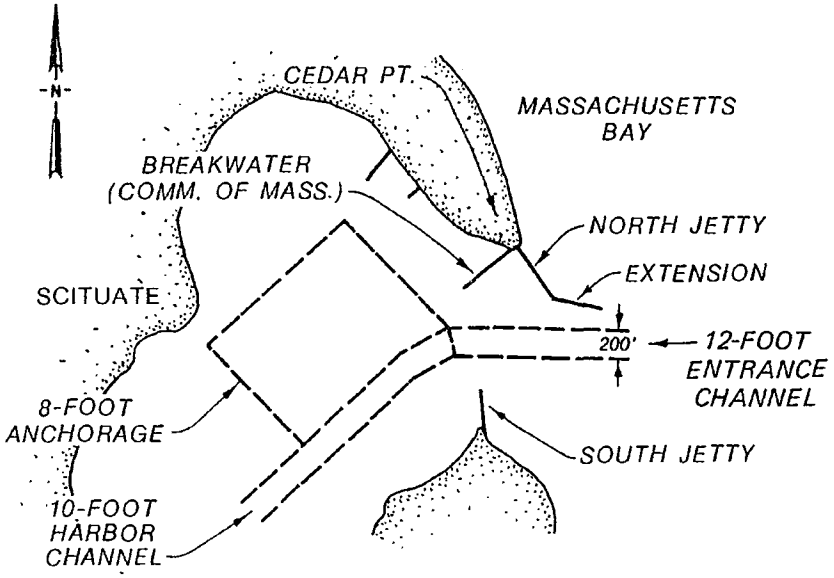


Figure 6. Scituate Harbor jetties

Cape Cod Bay, Massachusetts

15. Site 1e, Plymouth Harbor Dike at Long Beach (longitudinal dike). The navigation project includes a riprap-protected dike along Long Beach in Plymouth Bay (Figure 7). The navigation channel, which runs parallel with the

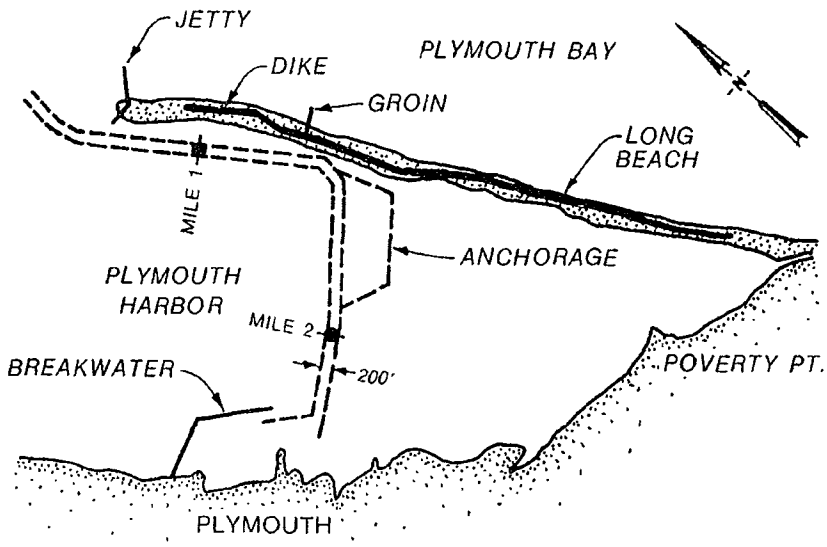


Figure 7. Plymouth Harbor dike at Long Beach

dike, is 200 ft wide and 18 ft deep. The mean range of tide is approximately 9.6 ft.

(NOAA Nautical Chart No. 13253)

Westport River, Massachusetts

16. Site 1f, longitudinal training dike (longitudinal dike). The navigation project proposed a longitudinal training dike separating the channel, located in the East Branch, from the West Branch (Figure 8). The dike would be constructed from Great Flat and extend approximately 2,500 ft southwest to a shoaled area called Lions Tongue. Also, to the east of this area is a proposed dike from Bailey Flat to Horse Neck Point (Figure 8). The project channel is 200 ft wide and 12 ft deep. The mean range of tide is 3 ft.

(NOAA Nautical Chart No. 13228)

Thames River, Connecticut

17. Several structures were constructed in this estuary. Five training dikes with tops at mean high water are located between river miles 8 and 12. The adjacent navigation channel is 200 ft wide and 25 ft deep. The mean range of tide is 2.6 ft at New London.

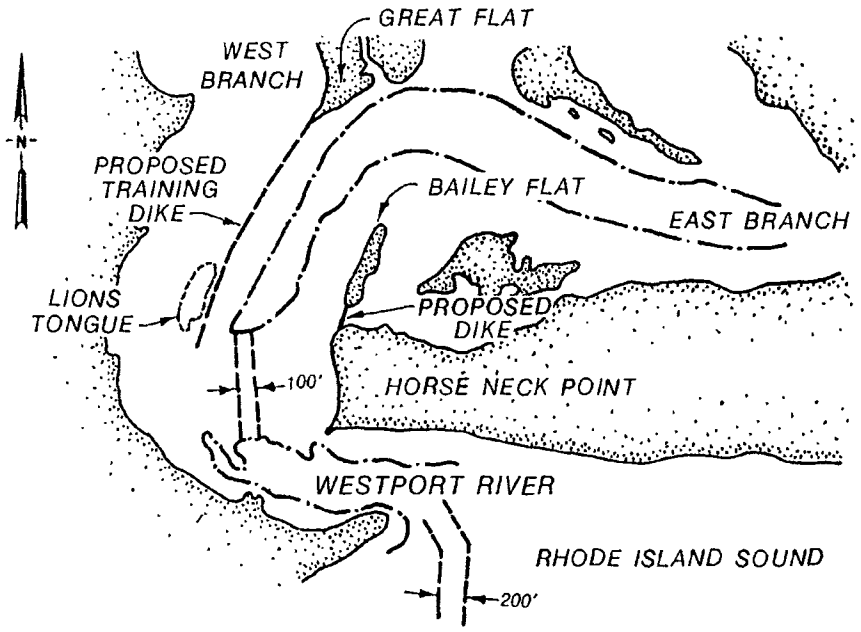


Figure 8. Westport River training dike

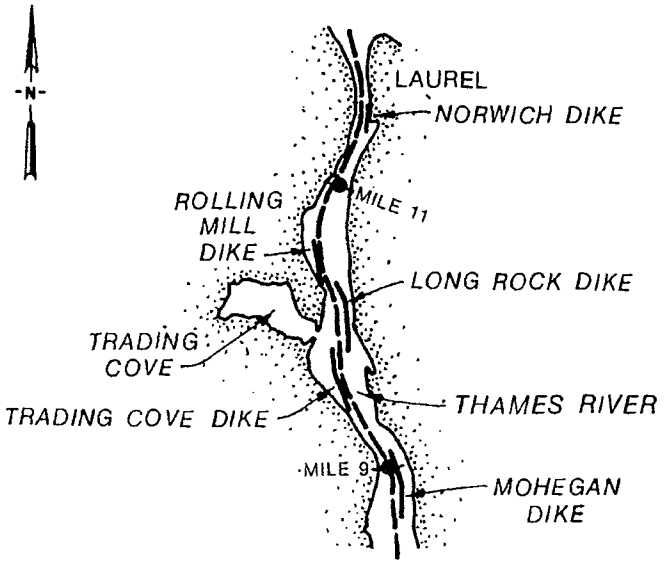


Figure 9. Thames River training walls

a. Site 1g.1, Mohegan Dike (longitudinal dike), 2,988 ft long, as shown in Figure 9.

b. Site 1g.2, Trading Cove Dike (longitudinal dike), 2,370 ft long, as shown in Figure 9.

c. Site 1g.3, Long Rock Dike (longitudinal dike), 2,800 ft long, as shown in Figure 9.

d. Site 1g.4, Rolling Mill Dike (longitudinal dike), 3,483 ft long, as shown in Figure 9.

e. Site 1g.5, Norwich Dike (longitudinal dike), 1,050 ft long, as shown in Figure 9.

(NOAA Nautical Chart No. 12372)

Connecticut River below
Hartford, Connecticut

18. Several structures were constructed in this estuary. At site 1h, various training structures are located in the navigation project between river miles 24 and 51 (Figure 10). The navigation channel is 150 ft wide and 15 ft deep. The mean range of tide averages 3.5 ft at the mouth and 1 ft at Hartford (low stage).

a. Site 1h.1, Hartford Training Wall (longitudinal dike). The dike is located on the west bank between river miles 50 and 51, at Hartford. The dike is about 3,700 ft long and is aligned parallel with the navigation channel.

b. Site 1h.2, dikes and hurdles (lateral dikes). Clusters of dikes and hurdles are indicated near river miles 43, 45, 46, 47, 48, and 49. The dikes and hurdles are relatively short and perpendicular to the channel. In several cases, hurdles (a type of spur or lateral dike) are indicated opposite a dike cluster.

c. Site 1h.3, Glastonbury Wing Dam (longitudinal dike).

d. Site 1h.4, submerged dike (lateral dike). The dike is located near mile 36. The dike projects about 900 ft east from the bank, and then about 700 ft south parallel with the west bank of Gildersleeve Island. The navigation channel parallels the island's east bank.

e. Site 1h.5, Portland Bar Dike (lateral dike).

f. Site 1h.6, Sears Shoal Dike (longitudinal dike). The dike, located near mile 24, projects about 1,800 ft south from Hurd Brook.

(NOAA Nautical Chart No. 12377)

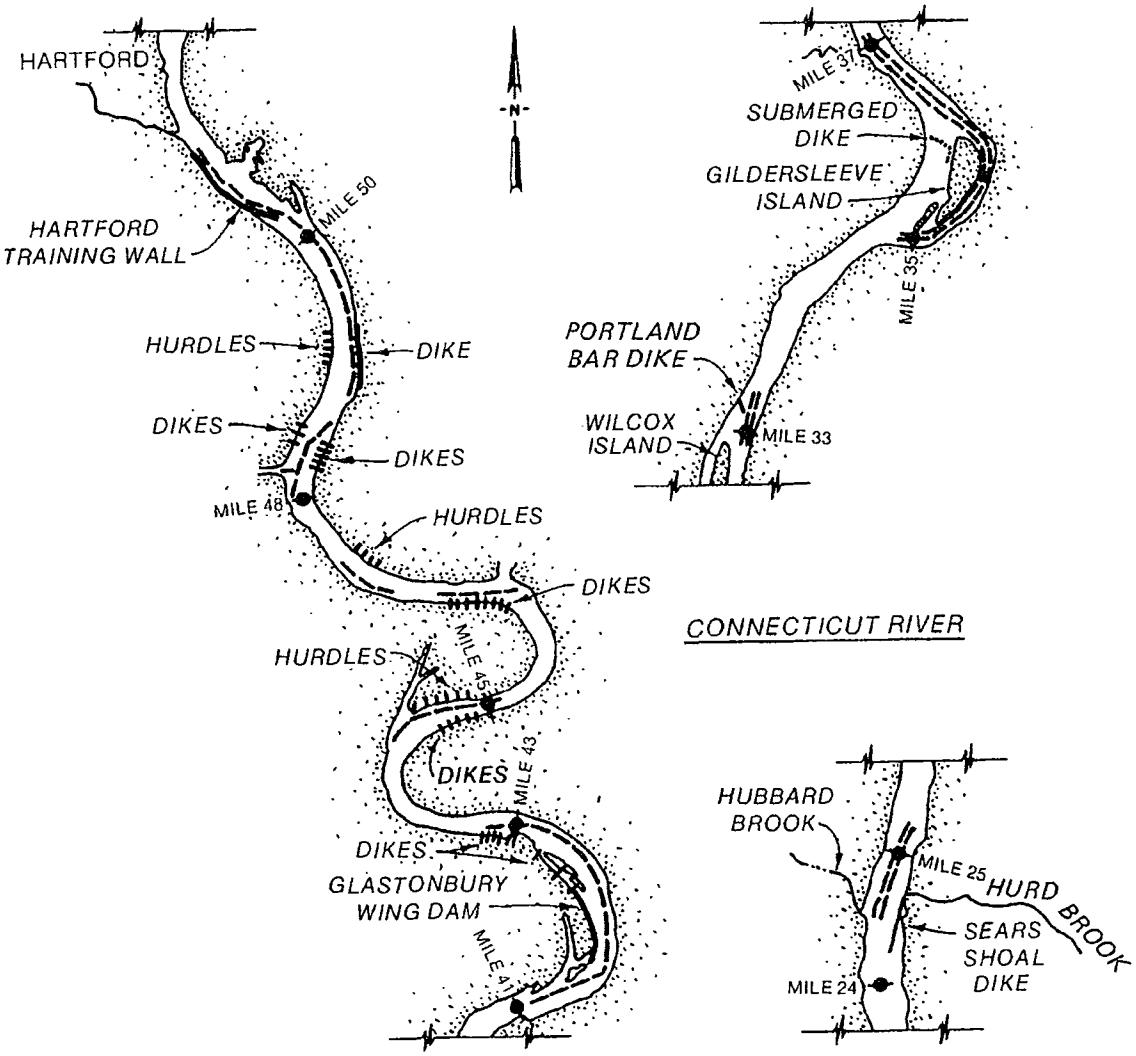


Figure 10. Connecticut River training structures

New Haven Harbor, Connecticut

19. Site 1i, pile and riprap dike (longitudinal dike). The navigation project includes a pile and riprap dike located at Sandy Point near mile 3 (Figure 11). The closure part of the dike is about 1,600 ft long, and extends in an easterly direction from Sandy Point to the main dike section, which itself extends about 2,400 ft parallel with the navigation channel in a southerly direction. The navigation channel is 400 ft wide and 35 ft deep. The mean range of tide is 6.2 ft.

(NOAA Nautical Chart No. 12371)

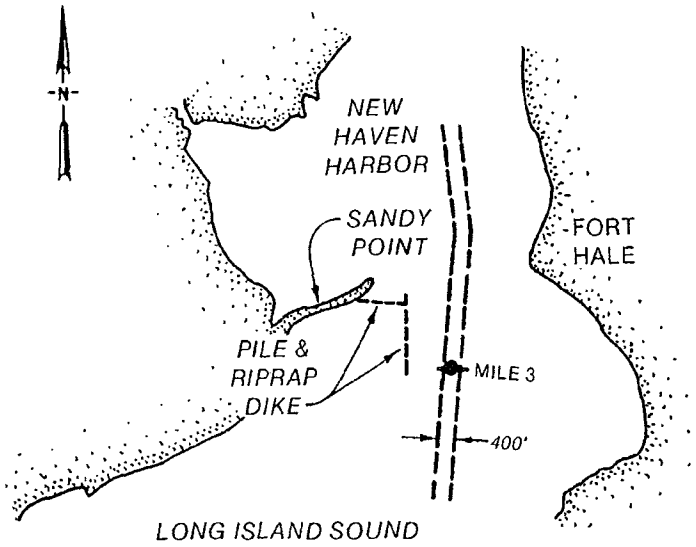


Figure 11. Longitudinal dike in New Haven Harbor

Milford Harbor, Connecticut

20. Site 1j, jetties. The navigation project includes two riprap jetties at the entrance to Wepawaug River (Figure 12). Burns Point Jetty is about 300 ft long and directed to the south, and Long Jetty is about 450 ft long and directed to the west. The project entrance channel is 100 ft wide and 10 ft deep. The mean range of tide is 6.6 ft.

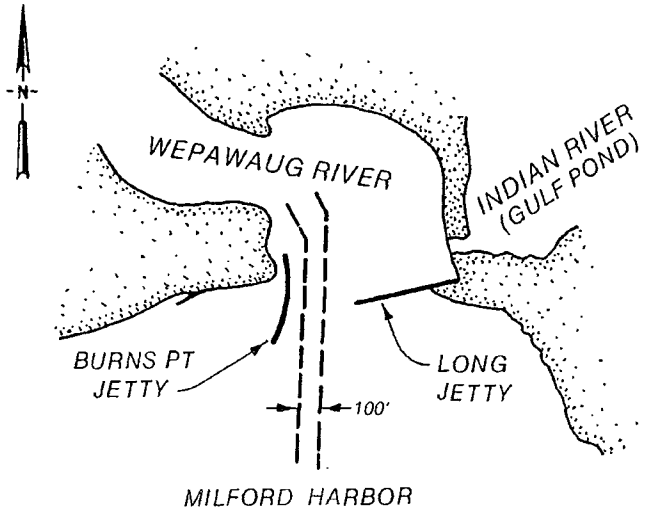


Figure 12. Milford Harbor jetties

Housatonic River, Connecticut

21. Two structures were constructed in this estuary:

a. Site 1k.1, dike (longitudinal dike). A riprap dike was constructed at Stratford near mile 2 (Figure 13). The project was limited to a length of 1,500 ft. The project navigation channel is 200 ft wide and 18 ft deep. The mean range of tide is about 5.5 ft.

b. Site 1k.2, jetty (lateral dike). A 163-ft-long riprap jetty that functions as a lateral dike was constructed near Sow and Pigs Rock, near mile 13 (Figure 13). The project navigation channel is 100 ft wide and 7 ft deep. The mean range of tide is about 5.0 ft.

(NOAA Nautical Chart No. 12370)

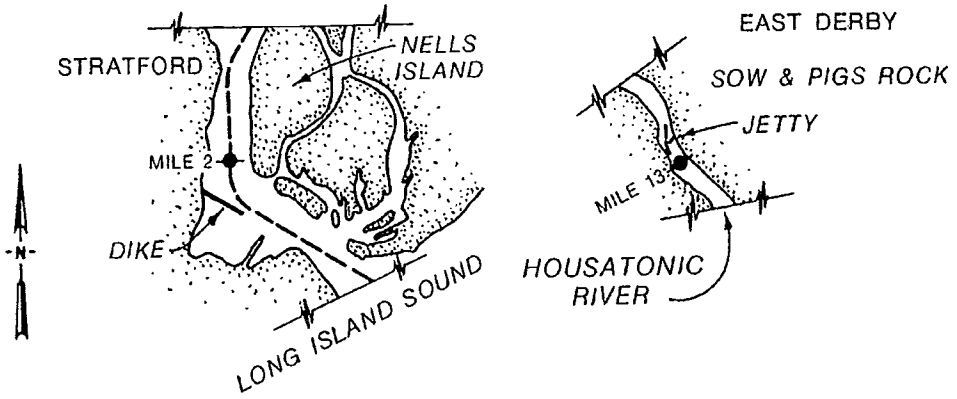


Figure 13. Training structures in the Housatonic estuary

Southport Harbor, Connecticut

22. Site 1l, dike (longitudinal dike). The navigation project includes a longitudinal dike about 1,350 ft long on the east bank of Mill River (Figure 14). The project channel varies from 400 to 175 ft wide and is 9 ft deep. The mean range of tide is 6.9 ft.

(NOAA Nautical Chart No. 12369)

Bullocks Point Cove, Rhode Island

23. Site 1m, dike and jetty (jetty). The navigation project includes a rubblestone dike and jetty that were constructed to build the tip of Bullocks

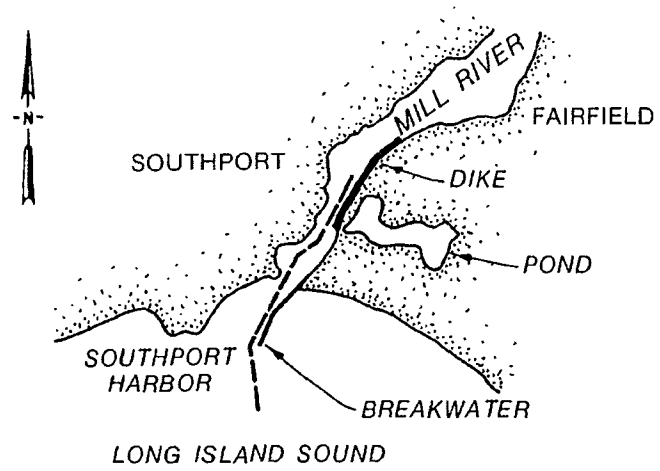


Figure 14. Longitudinal dike in the Mill River estuary

Point to a height of 9 ft above mean low water (Figure 15). The dike, which is about 350 ft long in an easterly direction, is connected to a jetty that extends about 250 ft in a southerly direction. The area between was back-filled with dredged sands, which was completed in 1959. The project channel is 75 ft wide and 8 ft deep. The mean range of tide is 4.6 ft.

(NOAA Nautical Chart No. 13224)

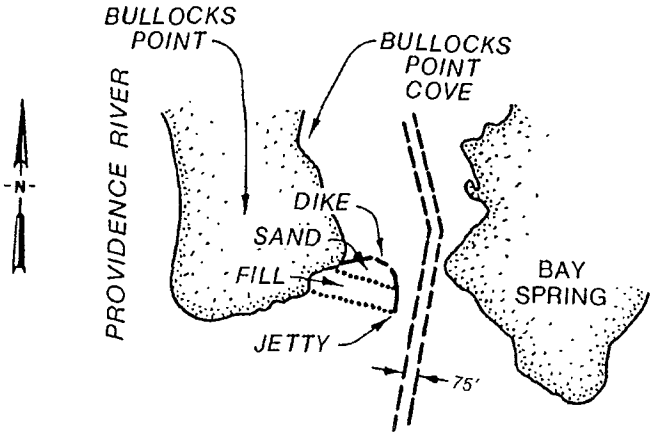


Figure 15. Training structures at Bullocks Point Cove

North Atlantic Division

New York District

24. About 40 training structures are located within the jurisdiction of the New York District (US Army Engineer District, New York, 1975). The structure types include dikes and jetties, and are located as indicated in Figure 16.

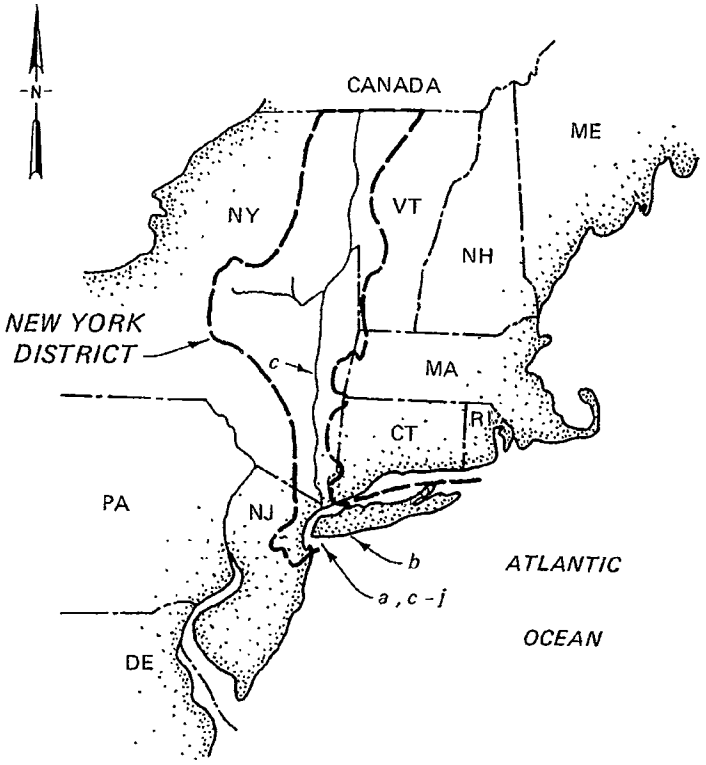


Figure 16. Location Plan 2, New York District

Flushing Bay and Creek, New York

25. Site 2a, dikes (longitudinal dikes). The two neighboring dikes are located in Flushing Bay, Queens, New York (Figure 17). An earth dike angles to the southeast from the approach area of LaGuardia Airport for about 2,400 ft and then extends almost due south for about 1,400 ft. The extension is listed as having riprap revetment. The second dike is adjacent and parallel to the channel and is labeled "US DIKE." The project channel depth in

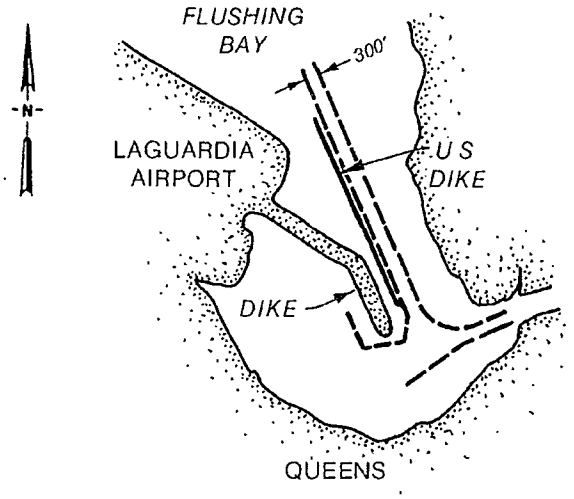


Figure 17. Dikes in Flushing Bay

this area is 15 ft and the width is 300 ft. The mean range of tide is 6.8 ft.

(NOAA Nautical Chart No. 12366)

Browns Creek, Great South Bay, New York

26. Site 2b, jetties. Two stone jetties extend into Great South Bay from the entrance of Browns Creek (south of Sayville) (Figure 18). The

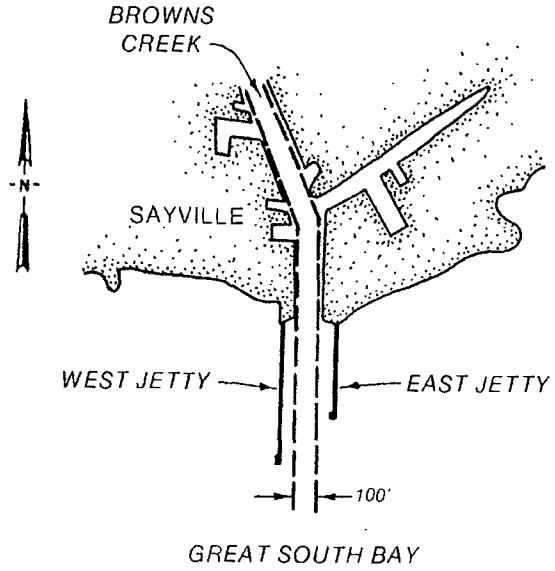


Figure 18. Stone jetties at Browns Creek

jetties are authorized to be 1,400 ft (east) and 1,600 ft (west) long. The project channel depth is 6 ft and the width is 100 ft. The mean range of tide is 0.7 ft.

(NOAA Nautical Chart No. 12352)

Hudson River, New York

27. Site 2c. The following structures are located along the Hudson River, and are indicated in Figures 19-21 as noted.

a. Site 2c.1, dike (longitudinal dike). The dike is located on Wappinger Creek (near mile 1), which is southwest of Wappinger Falls, New York (Figure 19). The structure is about 700 ft long and is adjacent and parallel to the navigation channel. The completed project channel depth is 8 ft and the width is 80 ft. The mean range of tide is 3 ft.

(NOAA Nautical Chart No. 12347)

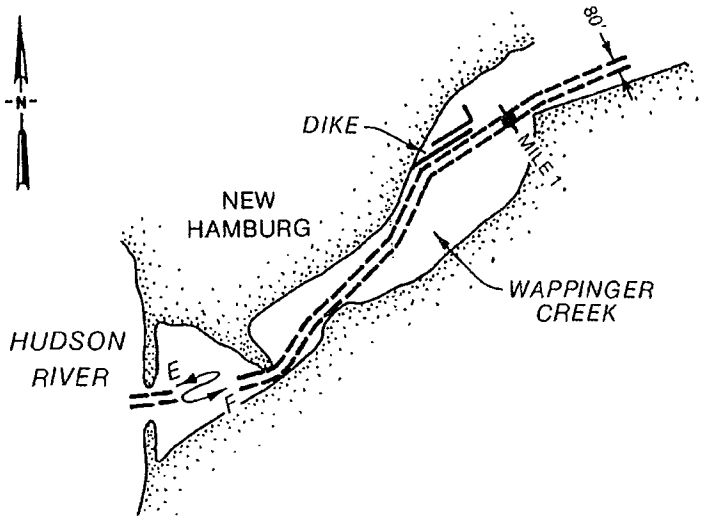


Figure 19. Dike at Wappinger Creek

b. Site 2c.2, dikes (jetties). Two dikes are located in Esopus Creek east of Saugerties (Figure 20). The completed harbor project includes the north and south dikes, which are each about 2,000 ft long and parallel to the bank, with the south dike extending into the Hudson River functioning as a jetty. The project channel is 12 ft deep and 200 ft wide. The mean range of tide is about 3.8 ft.

(NOAA Nautical Chart No. 12347)

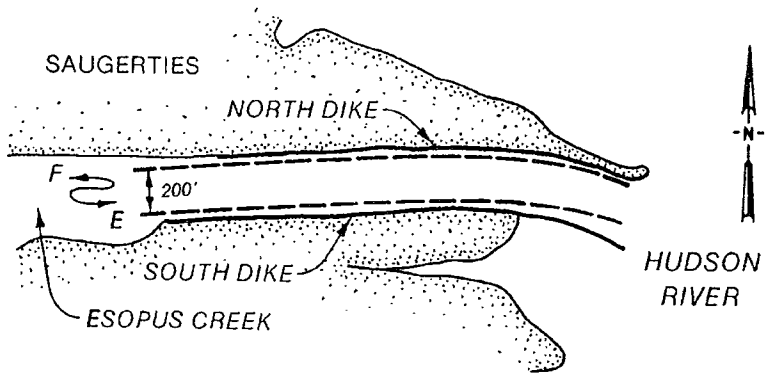


Figure 20. Dikes at Esopus Creek

c. Site 2c.2, dikes (jetties). Two dikes that function as jetties were constructed at the entrance of Rondout Harbor in the Hudson River (Figure 21). The parallel dikes are about 350 ft apart and 2,000 ft long. The north dike has a northerly branch about 800 ft long that functions as a longitudinal dike. The navigation channel at the entrance is 14 ft deep and 100 ft wide. The mean range of tide at Rhinecliff (south of Kingston) is about 3.7 ft.

(NOAA Nautical Chart No. 12347)

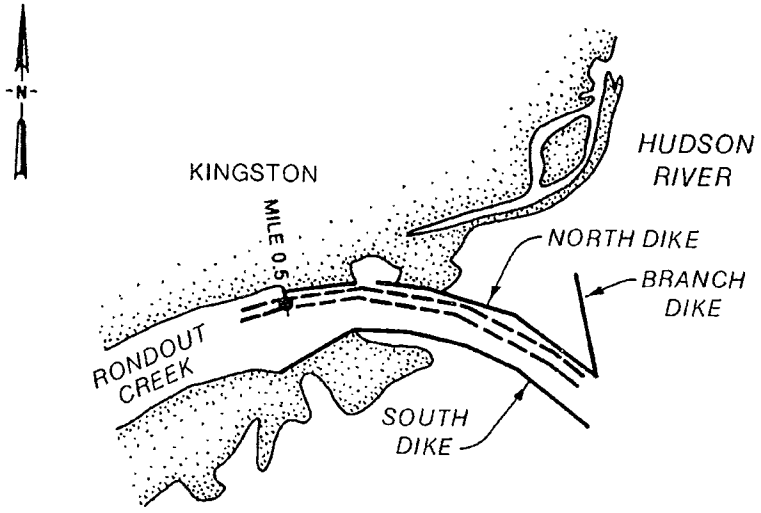


Figure 21. Dikes at the Rondout Harbor entrance

28. The following is a listing of structures that are located in the Hudson River estuary between New York City and Waterford (Figure 22). The federal navigation channel begins at New York City (600 ft wide and 32 ft deep) and ends at Waterford (200 ft wide and 14 ft deep), which is a distance

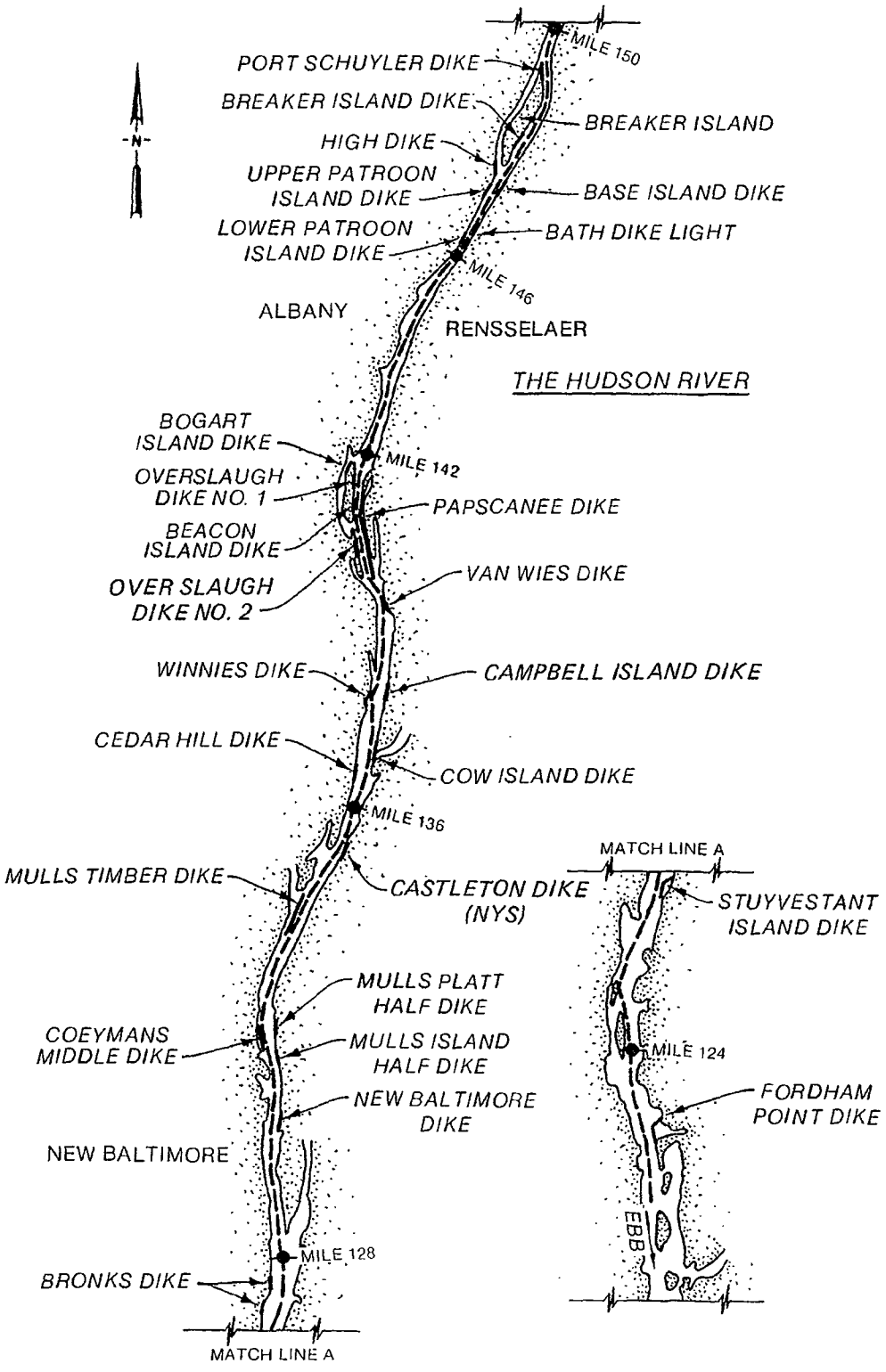


Figure 22. Training structures in the Hudson River estuary

of about 155 miles. The mean range of tide at Stuyvestant is about 4.2 ft.

(NOAA Nautical Chart No. 13448)

a. Site 2c.3, dike (longitudinal dike). Located on Fordham Point, on eastern bank, mile 122.

b. Site 2c.4, dike (longitudinal dike). Located on Stuyvestant Island, on eastern side, mile 127.

c. Site 2c.5, dike (longitudinal dike). Located on the western bank near Bronks, mile 128.

d. Site 2c.6, dike (longitudinal dike). Located at New Baltimore, on the eastern bank, mile 131.

e. Site 2c.7, dike (longitudinal dike). Located at mile 132 is the Mulls Island Half Dike, on the eastern bank.

f. Site 2c.8, dike (longitudinal dike). Mulls Platt Half Dike is located near the Mulls Island Half Dike, both being on Lower Schodak Island.

g. Site 2c.9, dike (longitudinal dike). Coeymans Middle Dike is located on the western side of the channel near Coeyman, mile 132.

h. Site 2c.10, dike (longitudinal dike). Mulls Timber Dike is located on the western side of the channel, mile 134, south of the New York State Thruway bridge.

i. Site 2c.11, dike (longitudinal dike). A New York State-maintained dike (Castleton Dike) is located on the eastern bank near mile 136.

j. Site 2c.12, dike (longitudinal dike). Cedar Hill Dike is located on the western bank just north of mile 136.

k. Site 2c.13, dike (longitudinal dike). Cow Island Dike is located on the eastern bank opposite Cedar Hill.

l. Site 2c.14, dike (longitudinal dike). Winnies Dike is located on the western bank near Bear Island, mile 138.

m. Site 2c.15, dike (longitudinal dike). Campbell Island Dike is located on the eastern bank opposite Winnies Dike.

n. Site 2c.16, dike (longitudinal dike). Van Wies Dike is located on Papscanee Island, which is east of the navigation channel, mile 139.

o. Site 2c.17, dike (longitudinal dike). Overslaugh Dike No. 2 is located on the western side of the navigation channel, mile 140.

p. Site 2c.18, dike (longitudinal dike). Beacon Island Dike is located on the western side of the navigation channel, mile 141.

q. Site 2c.19, dike (longitudinal dike). Overslaugh Dike No. 1 is adjacent to the Beacon Island Dike.

r. Site 2c.20, dike (longitudinal dike). Papscanee Dike is located opposite the previous two dikes on the eastern bank on Papscanee Island.

s. Site 2c.21, dike (longitudinal dike). Bogart Island Dike is located on Westerlo Island on the western side of the navigation channel at mile 142.

t. Site 2c.22, dike (longitudinal dike). Lower Patroon Island Dike is located on the western bank at mile 146, and is opposite the Bath Dike light (east of navigation channel).

u. Site 2c.23, dike (longitudinal dike). Upper Patroon Island Dike is north of the lower dike.

v. Site 2c.24, dike (longitudinal dike). Base Island Dike is located on the eastern bank, mile 147, and is several thousand feet long.

w. Site 2c.25, dike (longitudinal dike). High Dike is located on the western bank near the bifurcation below Breaker Island.

x. Site 2c.26, dike (longitudinal dike). Breaker Island Dike is located on Breaker Island, west of the navigation channel below the Troy-Menands Bridge.

y. Site 2c.27, dike (longitudinal dike). The Port Schuyler Dike is located on the north end of Breaker Island, west of the navigation channel, mile 149.

New York and New Jersey channels

29. Site 2d, US Dike (longitudinal dike). The dike (labeled "US DIKE") is located on the north side of the navigation channel near Shooter Island at the mouth of Newark Bay (Figure 23). The dike, which is about 4,000 ft long, protects the channel near the junction of the channel with Newark Bay. The

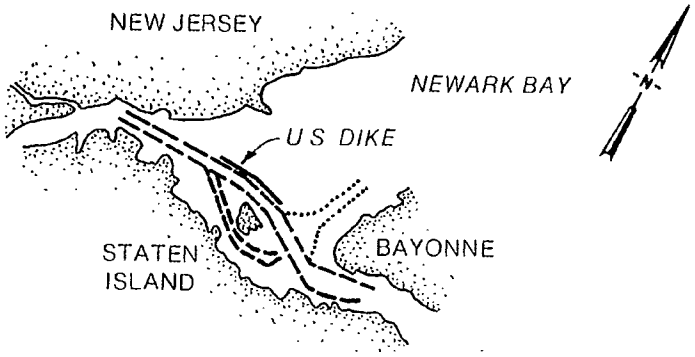


Figure 23. Shooter Island Dike

project channel is 35 ft deep and varies from 500 to 600 ft wide. The mean range of tide is about 4.9 ft.

(NOAA Nautical Chart No. 12327)

Raritan River, New Jersey

30. Site 2e, US Dike (longitudinal dike). The dike (labeled "US DIKE") is located on the north end of an island adjacent to the north navigation channel (Figure 24). The project channel is 25 ft deep and 300 ft wide near mile 5. The mean range of tide is about 5 ft.

(NOAA Nautical Chart No. 12332)

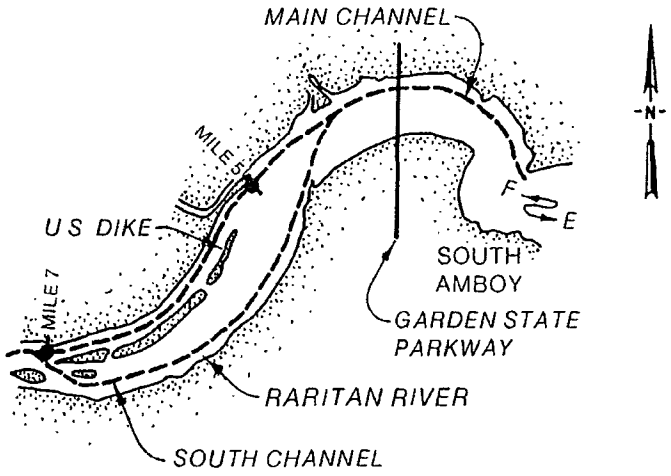


Figure 24. Raritan River Dike

Cheesequake Creek, New Jersey

31. Site 2f, jetties and dike (jetties and longitudinal dike). The structures are located near Morgan, on Raritan Bay (Figure 25). Two parallel stone jetties about 700 ft long and 200 ft apart are located along the entrance channel. The project channel in this area is 5 ft deep and 100 ft wide. A sheet-pile dike was constructed inside the entrance to close the old channel. The mean range of tide is 4.9 ft.

(NOAA Nautical Chart No. 12331)

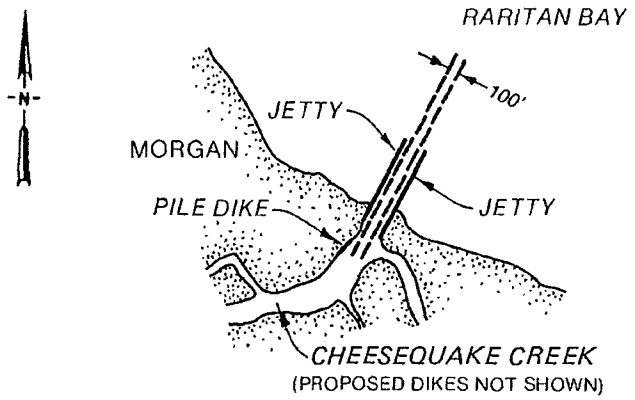


Figure 25. Training structures in Cheesequake Creek

Shoal Harbor and Compton Creek, New Jersey

32. Site 2g, dike (longitudinal dike). The dike is located at the eastern side of the entrance channel at Fishers Point (Figure 26). Although not labeled, it appears to be a closure type structure to prevent shoaling and protect the entrance from wind waves. The project channel is 12 ft deep and 75 ft wide. The mean range of tide is 4.7 ft.

(NOAA Nautical Chart No. 12324)

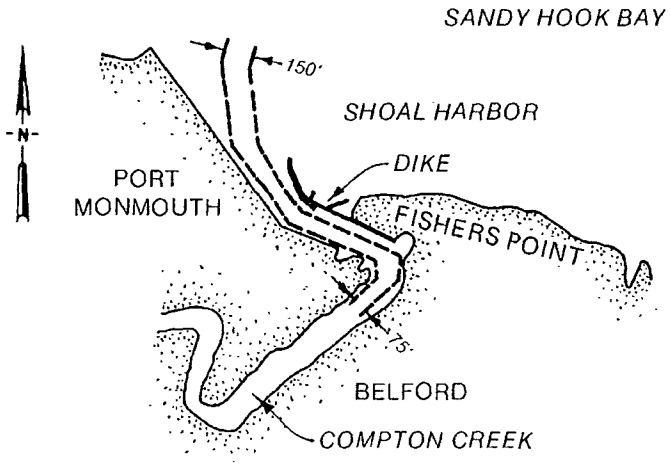


Figure 26. Dike at Shoal Harbor

Sandy Hook Bay, New Jersey

33. Site 2h, jetty. A single timber jetty was constructed at Leonardo, New Jersey, to protect the small boat harbor entrance channel (Figure 27). The jetty, which is about 220 ft long, projects north into Sandy Hook Bay and protects the project entrance, which is 8 ft deep and 150 ft wide. The mean range of tide is 4.7 ft.

(NOAA Nautical Chart No. 12330)

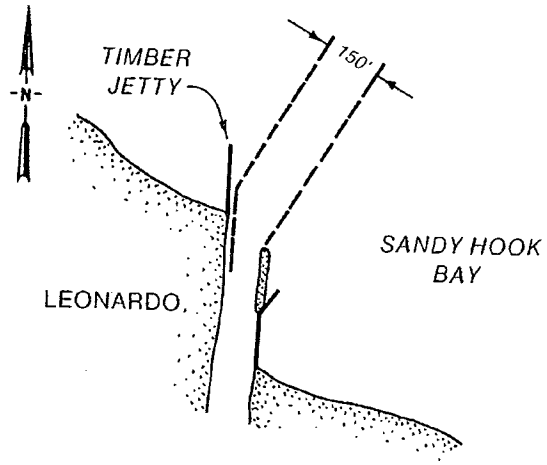


Figure 27. Harbor entrance jetty in Sandy Hook Bay

Shrewsbury River, New Jersey

34. Site 2i, dike (longitudinal dike). The dike is located at the confluence of the north and south branches of the Shrewsbury River (Figure 28).

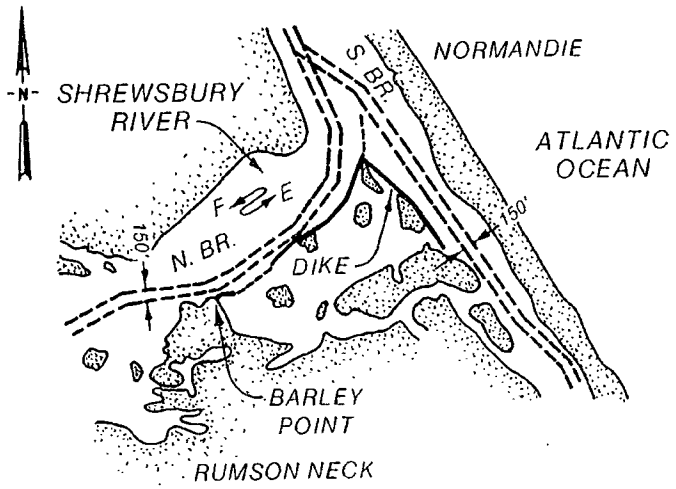


Figure 28. Longitudinal dike in the Shrewsbury River

The dike, which is almost 4,000 ft long, begins at Barley Point and extends easterly and then northerly into the bifurcation of the two channels at Normandie. At this location, the north branch project channel is 6 ft deep and 150 feet wide, and the south branch project channel is 9 ft deep and 150 ft wide. The mean range of tide is 2.8 ft.

(NOAA Nautical Chart No. 12324)

35. Site 2j has been disqualified from the inventory.

North Atlantic Division
Philadelphia District

36. About 40 training structures are within the jurisdiction of the Philadelphia District (US Army Engineer District, Philadelphia, 1979). The structures include dikes and jetties, and are located as indicated in Figure 29.

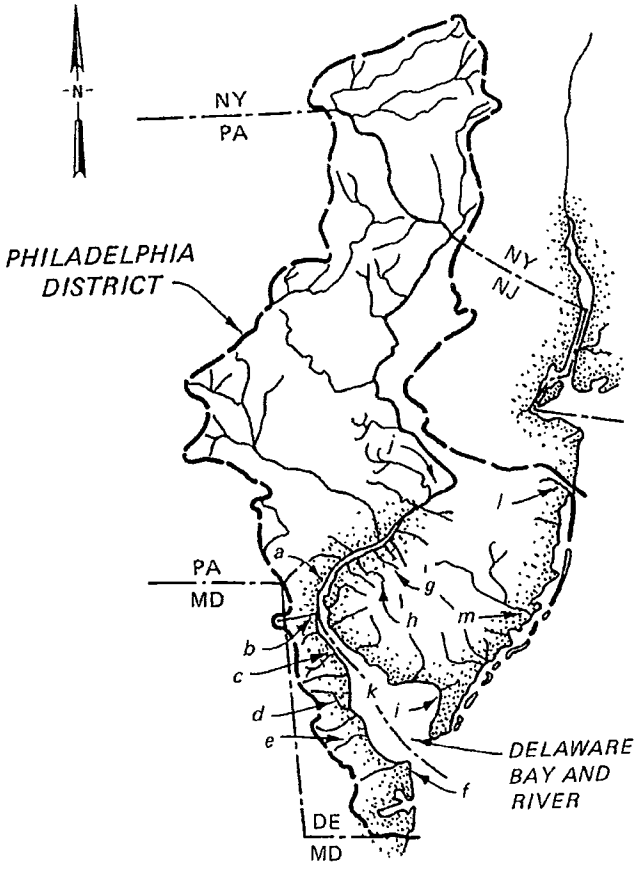


Figure 29. Location Plan 3,
Philadelphia District

Wilmington Harbor, Delaware

37. Site 3a, jetties. Two jetties extend into the Delaware River from the entrance of the Christina River (Figure 30). The south jetty, which is about 1,800 ft long, approaches the Delaware navigation channel, and the north jetty, which is about 500 ft long, is set back from the Delaware River. A third jetty maintains the channel near the entrance of the Brandywine River.

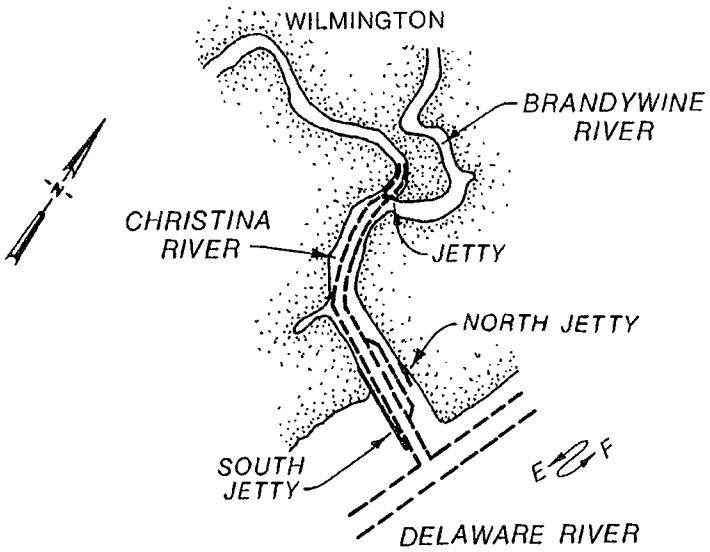


Figure 30. Jetties at Wilmington Harbor

The Christina River channel project dimensions are 35 ft deep and 400 ft wide at the entrance, and 21 ft deep and 250 ft wide at the confluence with the Brandywine. The mean range of tide at the mouth is 5.6 ft.

(NOAA Nautical Chart No. 12311)

Inland Waterway, Delaware River to
Chesapeake Bay, C & D Canal, Delaware

38. Site 3b, jetties. Two jetties were constructed at the entrance of the C & D Canal into the Delaware River and later authorized for extension (Figure 31). The jetties are approximately 2,000 ft long, and the canal dimensions are 35 ft deep and 450 ft wide. The mean range of tide is estimated at 2.5 ft near Reedy Point.

(NOAA Nautical Chart No. 12277)

Smyrna River, Delaware

39. Site 3c, jetties. Two parallel stone-filled pile and timber jetties were constructed in 1939 at the entrance to the Delaware Bay (Figure 32). The jetties, the longest of which is about 2,800 ft long, protect the

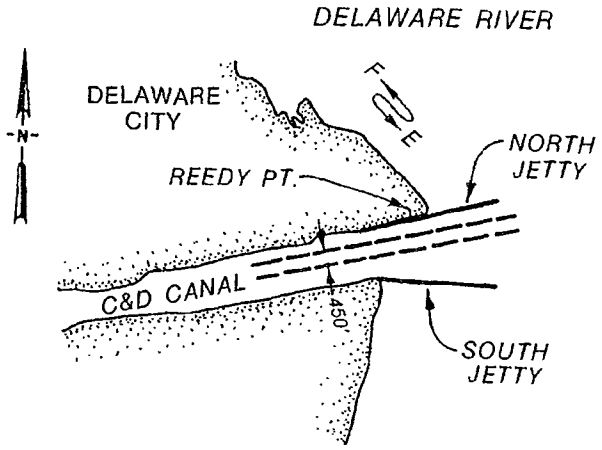


Figure 31. C & D Canal entrance jetties

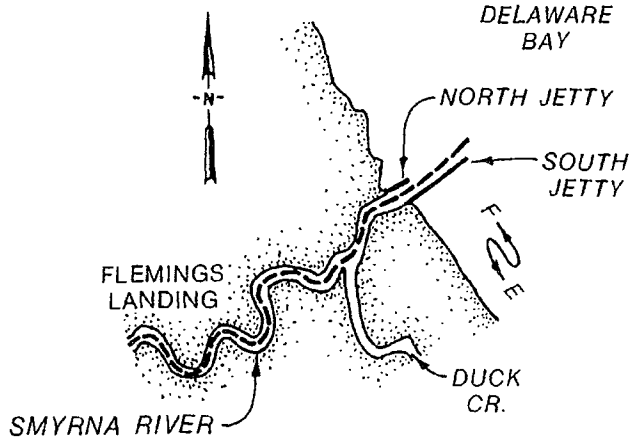


Figure 32. Entrance jetties for the Smyrna River

7-ft-deep by 100-ft-wide navigation channel. The range of tide at the mouth is 6.0 ft.

(NOAA Nautical Chart No. 12311)

St. Jones River, Delaware

40. Site 3d has been disqualified from the inventory.

Mispillion River, Delaware

41. Site 3e, jetties. Two stone-filled pile and timber jetties were constructed in 1939 at the mouth of the river (Figure 33). The 5,000-ft-long jetties protect the 9-ft-deep by 80-ft-wide entrance channel. The mean range of tide at the mouth is 4.4 ft.

(NOAA Nautical Chart No. 12304)

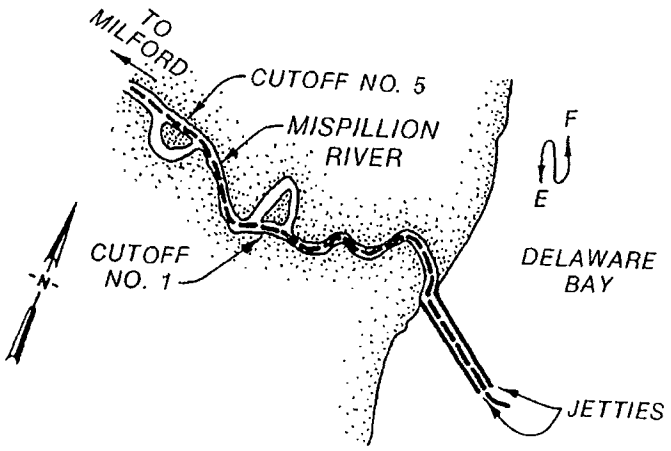


Figure 33. Mispillion River entrance jetties

Inland Waterway, Rehoboth Bay to Delaware Bay, Delaware

42. Site 3f, jetties. Two parallel jetties were constructed in 1938 at the Delaware Bay entrance (Figure 34). The jetties at the Rehoboth Bay entrance were constructed in 1903 under a previous project. The project dimensions at the Delaware Bay entrance are 10 ft deep and 200 ft wide. The

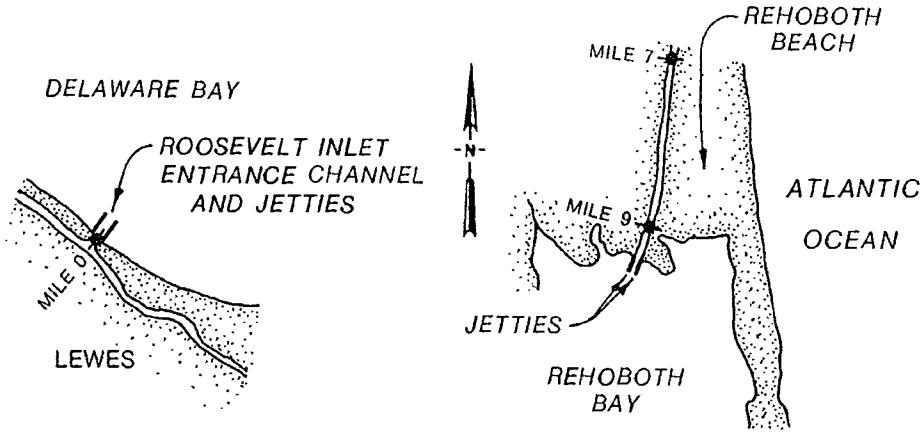


Figure 34. Inland Waterway entrance jetties

mean range of tide is 4.2 ft at the entrance and 0.6 ft at the Rehoboth Bay entrance.

(NOAA Nautical Chart No. 12216)

Mantua Creek, New Jersey

43. Site 3g, jetties. Two parallel jetties were constructed in 1940 at the entrance to the Delaware River (Figure 35). The jetties were rehabilitated under contract in 1963. The project dimensions at the entrance are 20 ft in depth and 110 ft in width. The mean range of tide is 5.9 ft.

(NOAA Nautical Chart No. 12312)

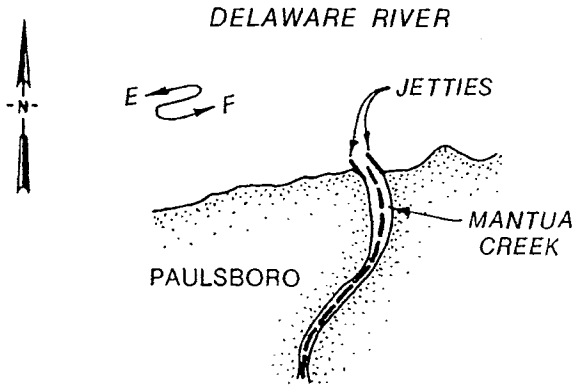


Figure 35. Mantua Creek entrance jetties

Raccoon Creek, New Jersey

44. Site 3h, jetty. A jetty was constructed in 1922 to protect the western side of the entrance channel (Figure 36). The project dimensions at the entrance are 7 ft in depth and 75 ft in width. The mean range of tide is 5.8 ft.

(NOAA Nautical Chart No. 12312)

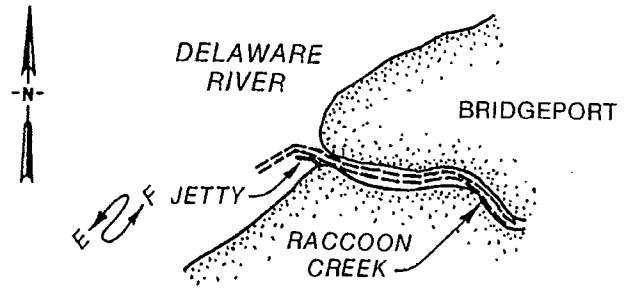


Figure 36. Raccoon Creek entrance jetty

Goshen Creek, New Jersey

45. Site 3i, jetties. Two jetties were constructed in 1900 to protect the entrance channel to Delaware Bay (Figure 37). No maintenance has been accomplished and the project is considered inactive. The project dimensions at the jetties were 3 ft deep and 50 ft wide. The mean range of tide is 5.6 ft.

(NOAA Nautical Chart No. 12214)

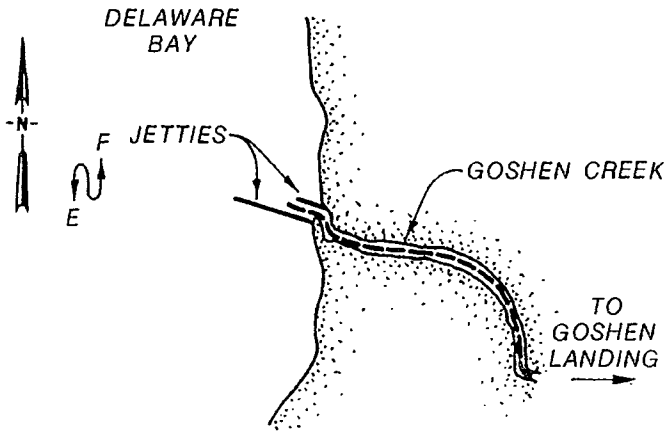


Figure 37. Goshen Creek entrance jetty

Neshaminy State Park Harbor, Pennsylvania

46. Site 3j, jetty. A stone jetty, 230 ft long, was completed in 1938 at the harbor entrance to the Delaware River under the Small Navigation Program, Section 107, River and Harbor Act of 1960 (Figure 38). The entrance channel is 8 ft deep and 60 ft wide. The mean range of tide is not listed.

(NOAA Nautical Chart No. 12314)

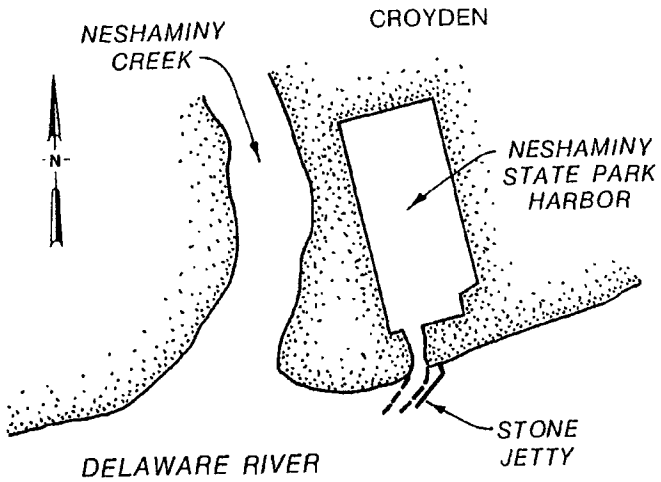


Figure 38. Neshaminy Harbor entrance jetty

Delaware River, Philadelphia, Pennsylvania, to the sea

47. Several structures were constructed in this estuary, including the following, shown in Figure 39:

a. Site 3k.1, Fisher Point Dike (longitudinal dike). The dike is located near Allegheny Avenue, on the Camden, New Jersey (east), side of the channel. The navigation channel at this location is 40 ft deep and 400 to 500 ft wide. The range of tide is 6.0 ft.

b. Site 3k.2, Howell Cove Dike (longitudinal dike). The dike is located near the mouth of Big Timber Creek on the New Jersey (east) side of the channel. In this location, the navigation project is 37 ft deep and 500 to 600 ft wide.

c. Site 3k.3, Mifflin Bar Dike (longitudinal dike). The dike is located near the Philadelphia International Airport on the Pennsylvania (west) side of the channel. In this location, the navigation channel is 40 ft deep and 800 ft wide.

d. Site 3k.4, Chester Island Dike (lateral dike). The dike is

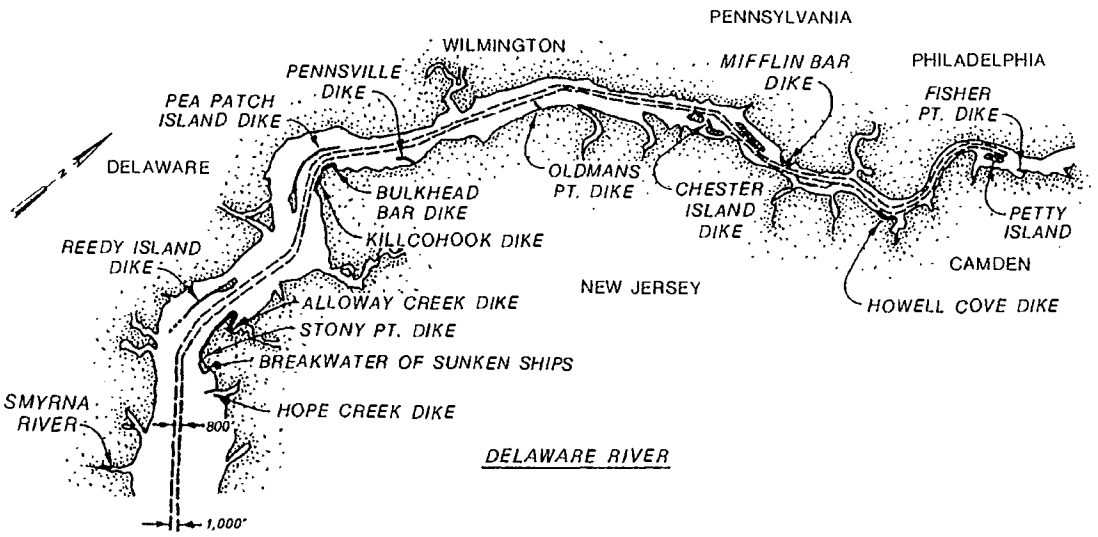


Figure 39. Training structures in the Delaware River estuary

located on the east side of the channel near Chester, Pennsylvania. In this area the navigation channel is 40 ft deep and 800 ft wide.

e. Site 3k.5, Oldmans Point Dike (lateral dike). The dike is located on the east side of the channel north of Pennsgrove, New Jersey. The navigation channel in this area is 40 ft deep and 800 ft wide.

f. Site 3k.6, Pennsville Dike (longitudinal dike). The dike is located south of the Twin Delaware Memorial Bridges on the east bank. The structure projects westerly about 1,400 ft, and then 1,400 ft parallel with the navigation channel.

g. Site 3k.7, Pea Patch Island Dike (longitudinal dike). The dike is located south of New Castle, Delaware, in the New Castle range of the navigation channel. The structure begins at Pea Patch Island, which is west of the channel, and arcs north, then east for about 3 miles.

h. Site 3k.8, Bulkhead Bar Dike (longitudinal dike). The dike is located on the New Jersey (east) side of the channel opposite the northern end of the Pea Patch Island Dike. The navigation channel in this area is 40 ft deep and 800 ft wide.

i. Site 3k.9, Killcohook Dike (longitudinal dike). The dike is located on the New Jersey (east) side of the navigation channel opposite the southern end of the Pea Patch Island Dike. The channel in this area is 40 ft deep and 800 ft wide.

j. Site 3k.10, Reedy Island Dike (longitudinal dike). The structure is located west of the channel and south of Port Penn, Delaware. The structure begins at Reedy Island, and extends south for almost 3 miles.

k. Site 3k.11, Alloway Creek Dike (lateral dike). The dike is located at the northern end of Artificial Island on the New Jersey (east) side at the mouth of Alloway Creek. The navigation channel in this area is 40 ft deep and 800 ft wide.

l. Site 3k.12, Stony Point Dike (longitudinal dike). The dike is located just south of Alloway Creek on the east bank. The structure parallels the bank; however, it is tied to the bank by a breakwater of sunken ships.

m. Site 3k.13, Hope Creek Dike (lateral dike). The dike is located immediately below Stony Point. The dike is perpendicular to the channel and extends about 2,000 ft west from the bank. The range of tide is about 5.8 ft.

(NOAA Nautical Chart Nos. 12311, 12312, 12313)

Double Creek, New Jersey

48. Site 31, jetty. The project includes a pile and timber jetty at the mouth of Double Creek in Barnegat Bay (Figure 40). The jetty is 550 ft long and located on the north side of the navigation channel, which is 5 ft deep and 40 ft wide. The project, which was completed in 1912 and maintained by local interests, has a mean range of tide of 0.5 ft at the mouth.

(NOAA Nautical Chart No. 12324)

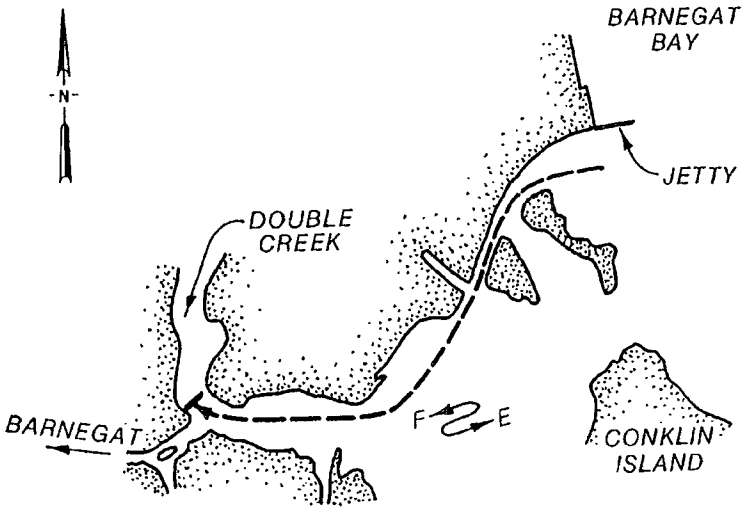


Figure 40. Double Creek entrance jetty

New Jersey Intracoastal
Waterway, Cape May Canal

49. Site 3m, jetties. Two parallel stone jetties were constructed in 1942 at the Delaware Bay entrance of the canal (Figure 41). The canal connects Cape May Harbor and the Intracoastal Waterway (ICWW) to the southern areas of Delaware Bay. The mean range of tide at the ICWW Delaware Bay entrance is 4.7 ft.

(NOAA Nautical Chart No. 12317)

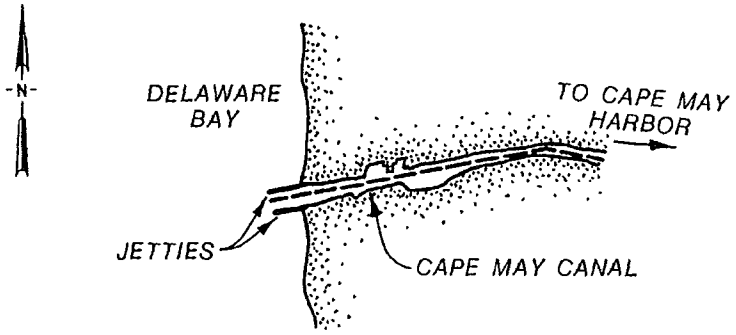


Figure 41. Cape May Canal entrance jetties

North Atlantic Division

Baltimore District

50. The Baltimore District lists about 18 training structures within the District's jurisdiction (US Army Engineer District, Baltimore, 1979). The structures include jetties and one timber bulkhead. The navigation projects are located as indicated in Figure 42.

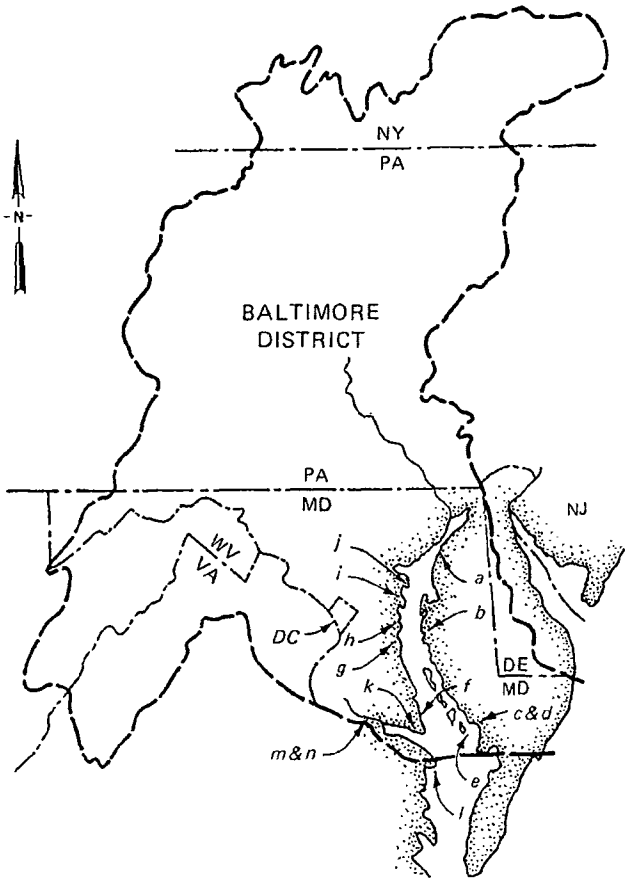


Figure 42. Location Plan 4, Baltimore District

Betterton Harbor, Maryland

51. Site 4a has been disqualified from the inventory.

Claiborne Harbor, Maryland

52. Site 4b, jetty. The project, which was completed in 1931, includes a harbor entrance channel and a jetty in Eastern Bay (Figure 43). The 150-ft-long slag jetty extends westward from a government wharf. The project channel

is 14 ft deep and 100 ft wide. The mean range of tide is 2.0 ft.

(NOAA Nautical Chart No. 12270)

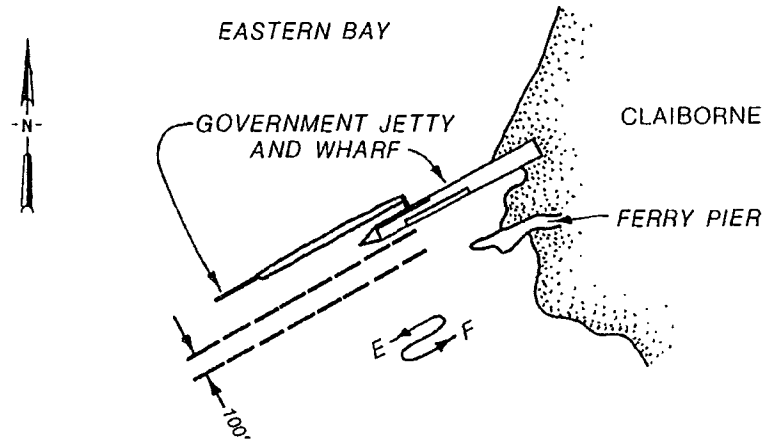


Figure 43. Harbor entrance jetty at Claiborne

Bivalve, Maryland

53. Site 4c, jetties. The project includes two parallel stone jetties (Figure 44). The jetties extend about 1,000 ft west in the Nanticoke River. The stone jetties protect the project entrance channel, which is 7 ft deep and 60 ft wide. The mean range of tide is 2.5 ft.

(NOAA Nautical Chart No. 12261)

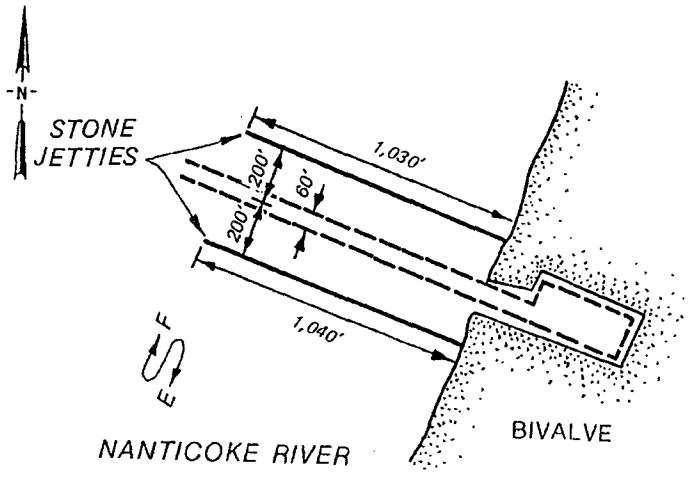


Figure 44. Harbor entrance jetties at Bivalve

Nanticoke, Maryland

54. Site 4d, jetties. The project provides for a small boat harbor at Nanticoke, with an entrance channel protected by jetties (Figure 45). The stone jetties, which are not parallel, extend westward into the Nanticoke River 800 and 700 ft, respectively, for the north and south locations. The project channel is 7 ft deep and 60 ft wide. The mean range of tide is 2.6 ft.

(NOAA Nautical Chart No. 12261)

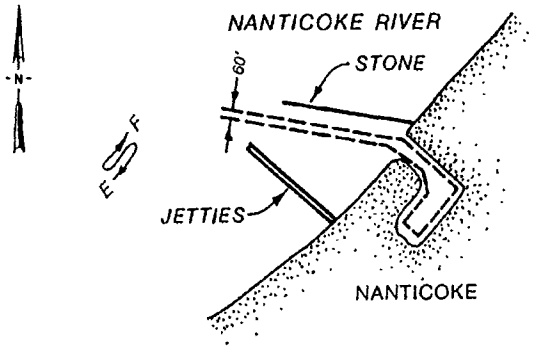


Figure 45. Harbor entrance jetties at Nanticoke

Twitch Cove and Big Thorofare River, Maryland

55. Site 4e, jetties. The project, located on Smith Island in the eastern Chesapeake Bay, includes twin jetties (Figure 46). The jetties protect the bay entrance of the channel that leads to Twitch Cove in Tangier Sound. The stone jetties were completed in 1956. The project channel at the entrance is 100 ft wide and 7 ft deep. The mean range of tide is 1.7 ft.

(NOAA Nautical Chart No. 12231)

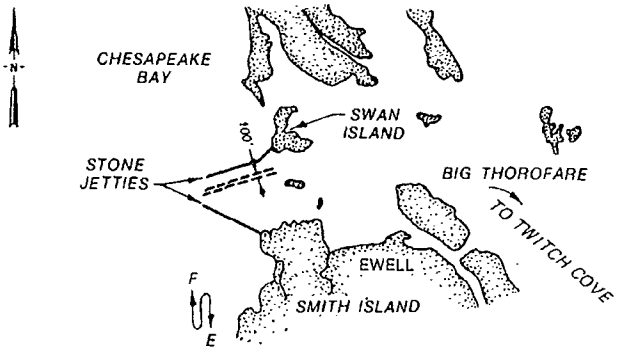


Figure 46. Entrance jetties at the Big Thorofare River

Governors Run, Maryland

56. Site 4f has been disqualified from the inventory.

Fishing Creek, Chesapeake Beach, Maryland

57. Site 4g, jetties. The project includes twin stone jetties protecting the entrance to Fishing Creek (Figure 47). The structures are each about 1,000 ft long and were completed in 1942. The jetties protect the 60-ft-wide by 7-ft-deep project entrance channel.

(NOAA Nautical Chart No. 12270)

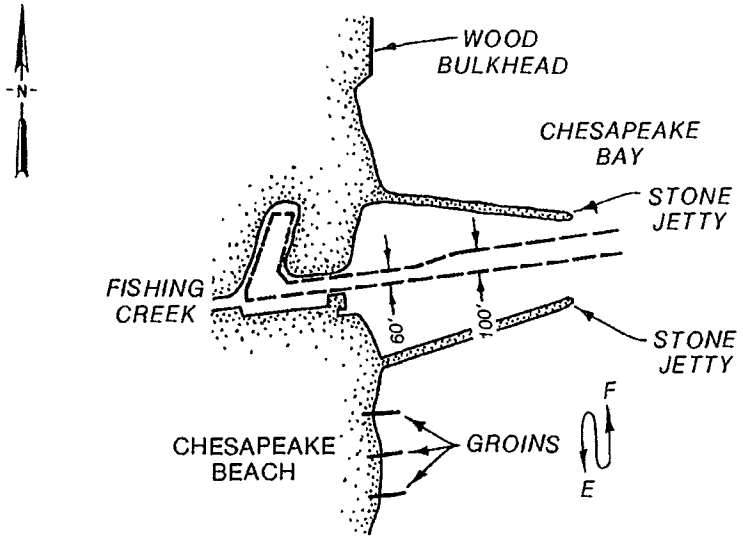


Figure 47. Entrance jetties at Fishing Creek

Broadwater Creek, Maryland

58. Site 4h has been disqualified from the inventory.

Lake Ogleton, Maryland

59. Site 4i has been disqualified from the inventory.

Back Creek, Maryland

60. Site 4j, jetty. The project, located near Eastport, provides for a navigation channel with a jetty protecting the entrance (Figure 48). The stone jetty, completed in 1939, is about 600 ft long and located on the south side of the entrance. The project channel is 100 ft wide and 8 ft deep. The mean range of tide is 0.9 ft.

(NOAA Nautical Chart No. 12270)

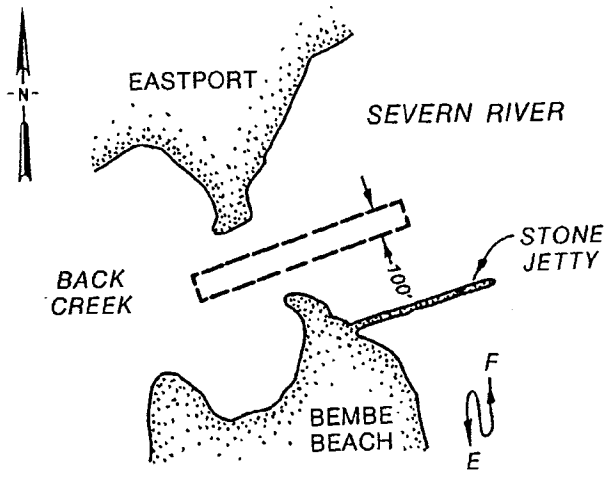


Figure 48. Jetty at Back Creek

Herring Creek, Maryland

61. Site 4k, jetties. Two stone jetties protect the project entrance to Herring Creek, near Tall Timbers, Maryland (Figure 49). The jetties, which are 770 and 650 ft long, were completed in 1961. The project navigation channel is 60 ft wide and 6 ft deep at the entrance. The range of tide (Potomac River) is 1.6 ft.

(NOAA Nautical Chart No. 12286)

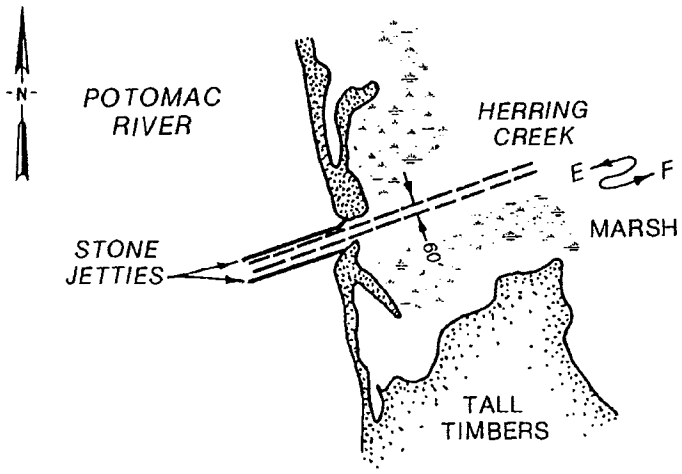


Figure 49. Jetties at Herring Creek

Little Wicomico River, Virginia

62. Site 4l, jetties and bulkhead. The project is located on the southern bank of the confluence of the Potomac River and the Chesapeake Bay (Figure 50). The project entrance is protected by two stone jetties: the northern jetty, which is about 1,000 ft long, and the southern jetty, which is about 1,300 ft long. Within the entrance, 1,007 lin ft of timber bulkhead was constructed to stabilize the dredged inner channel. The project navigation channel dimensions are 150 ft wide and 8 ft deep. The range of tide is 1.2 ft.

(NOAA Nautical Chart No. 13298)

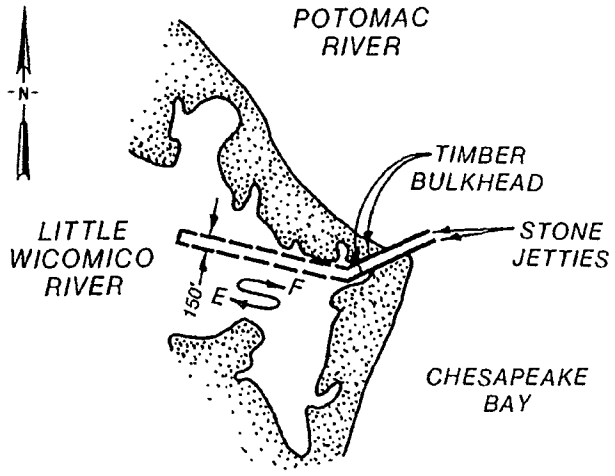


Figure 50. Jetties at the Little Wicomico River

Bonum Creek, Virginia

63. Site 4m, jetties. The navigation project is located near Tucker Hill on the Potomac River (Figure 51). The project provides for jetties to protect the entrance channel. The north jetty extends about 700 ft into the Potomac River and the south jetty extends about 300 ft. The project navigation channel is 60 ft wide and 6 ft deep. The range of tide is 1.6 ft.

(NOAA Nautical Chart No. 12286)

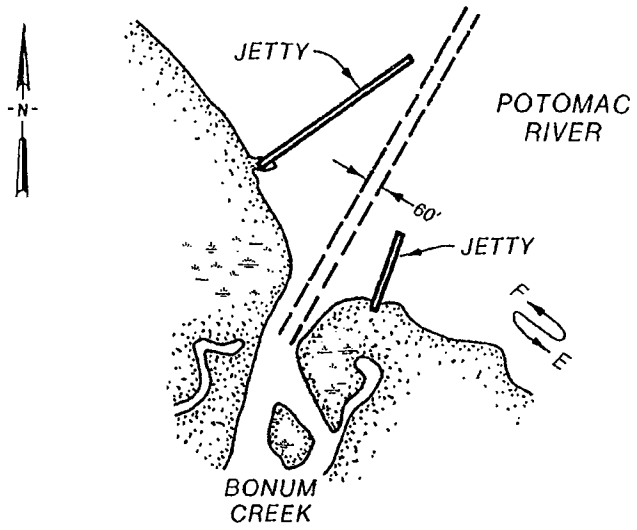


Figure 51. Jetties at Bonum Creek

Nomini Creek, Virginia

64. Site 4n, jetty. The navigation project provides for a stone jetty 2,410 ft long at the entrance of Nomini Creek to Nomini Bay (Figure 52). The project channel, which is 150 ft wide and 9 ft deep, and the jetty were completed in 1912. The range of tide is 1.8 ft.

(NOAA Nautical Chart No. 12286)

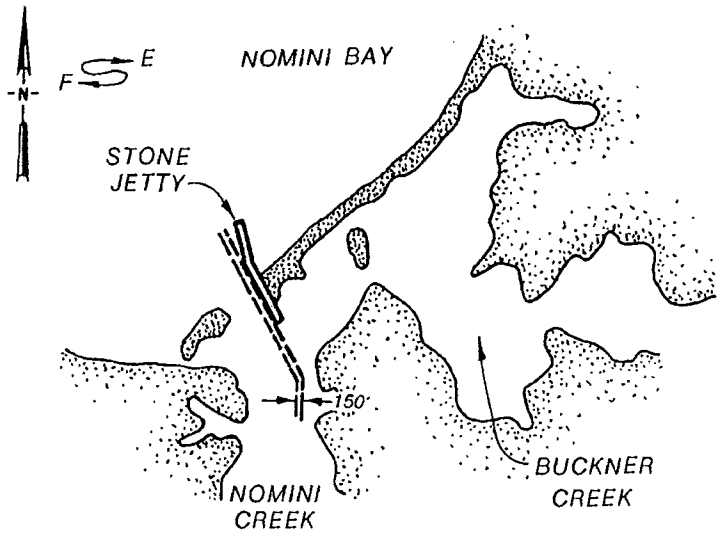


Figure 52. Jetty at Nomini Creek

North Atlantic Division

Norfolk District

65. The Norfolk District lists several training structures within the District's jurisdiction (US Army Engineer District, Norfolk, 1984). The structure types include dikes and jetties, and are located as indicated in Figure 53.

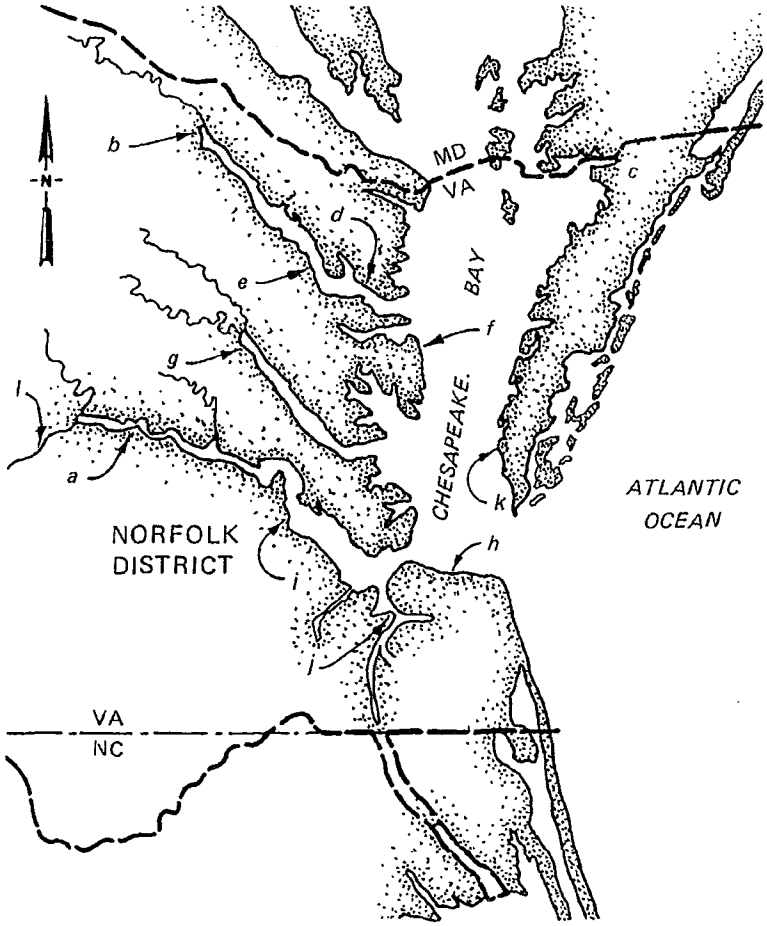


Figure 53. Location Plan 5, Norfolk District

James River, Virginia

66. Site 5a, spur and training dikes (longitudinal and lateral dikes). The navigation project provides for the construction of spur and training dikes along both banks of the James River between miles 75 and 90, south of

Richmond (Figure 54). No information is provided other than the general locations and that construction is complete (US Army Engineer District, Norfolk, 1984). The project navigation channel is 200 ft wide and 18 ft deep. The mean range of tide is about 3.2 ft.

(NOAA Nautical Chart No. 12251)

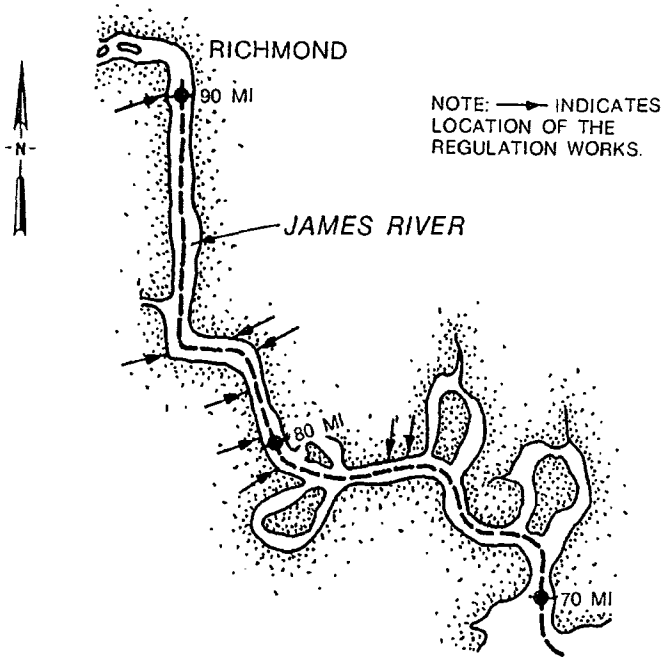


Figure 54. Location of the James River dikes

Rappahannock River, Virginia

67. Site 5b, dikes (longitudinal and lateral dikes). The navigation project provides for the construction of 20,401 lin ft of crib and pile dikes and 1,906 lin ft of riprap stone dike (Figure 55). Nine locations are noted on the project map as having contraction works but have no further identification or length. This particular reach is from Fredericksburg to mile 90 where the project navigation channel is 100 ft wide and 12 ft deep. The mean range of tide is about 2.8 ft.

(NOAA Nautical Chart No. 12237)

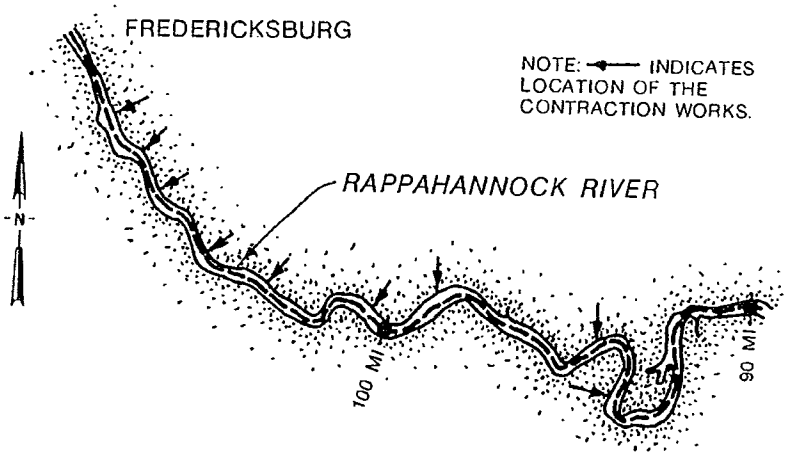


Figure 55. Location of the Rappahannock River dikes

Chincoteague Bay, Virginia

68. Site 5c has been disqualified from the inventory.

Carters Creek, Virginia

69. Site 5d, jetty. The navigation project provides for a jetty to protect the entrance channel to Carters Creek (Figure 56). The stone structure extends 742 ft to the south in the Rappahannock River. The project channel is 200 ft wide and 15 ft deep. The mean range of tide is about 1.4 ft.

(NOAA Nautical Chart No. 12237)

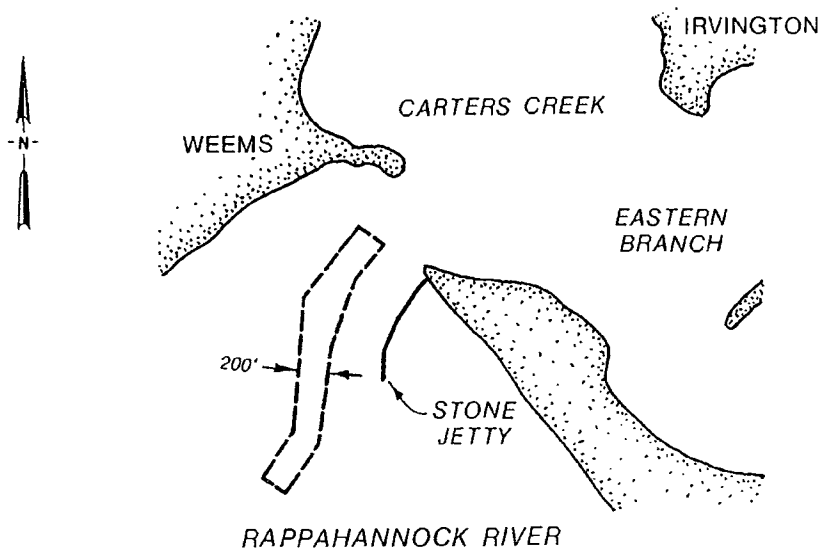


Figure 56. Carters Creek entrance jetty

Urbanna Creek, Virginia

70. Site 5e, jetties. The navigation project includes two jetties to protect the entrance channel to the Rappahannock River (Figure 57). The north jetty was constructed of stone and is 1,895 ft long, and the south jetty was constructed of timber and is 717 ft long. The project channel dimensions are 150 ft wide and 10 ft deep. The mean range of tide is about 1.6 ft.

(NOAA Nautical Chart No. 12237)

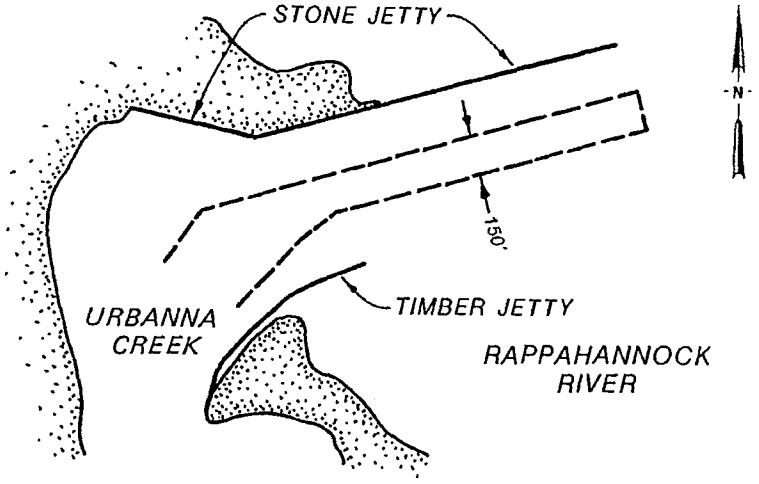


Figure 57. Urbanna Creek entrance jetties

Milford Haven, Virginia

71. Site 5f, jetty. The navigation project, located at the south end of Hills Bay, includes a jetty on the north side of the entrance (Figure 58). The stone jetty extends 1,183 ft from Narrows Point into Hills Bay. The project channel dimensions are 200 ft wide and 10 ft deep. The mean range of tide is about 1.3 ft.

(NOAA Nautical Chart No. 12238)

York River, Virginia

72. Site 5g, dike (longitudinal dike). A dike was constructed to control shoaling at the West Point Bar, river mile 32 (Figure 59). The dike, which is about 1,000 ft long, is located on the west side of the navigation

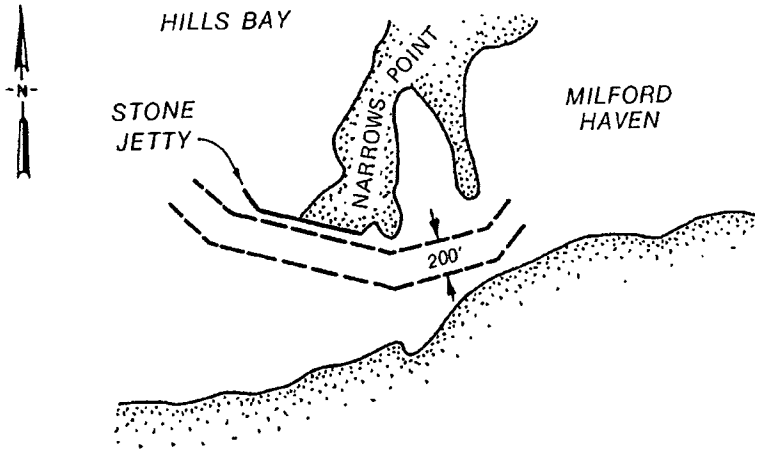


Figure 58. Jetty at Milford Haven

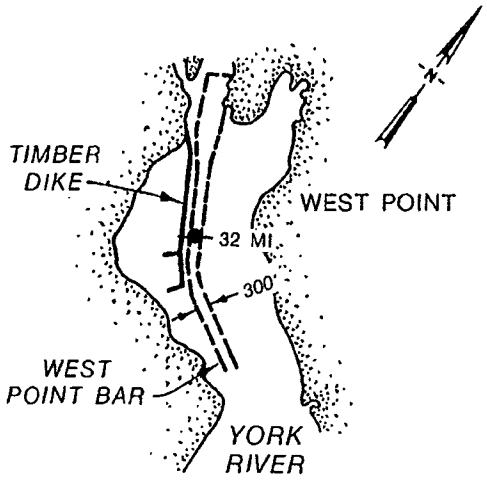


Figure 59. West Point Bar dike

channel. The project channel is 300 ft wide and 22 ft deep. The mean range of tide is about 3.0 ft.

(NOAA Nautical Chart No. 12243)

Little River (Creek), Virginia

73. Site 5h, jetties. Two stone jetties are indicated on the project map at the entrance to Little River (Figure 60). The west jetty is about 600 ft long and the east jetty about 1,000 ft long. The project entrance

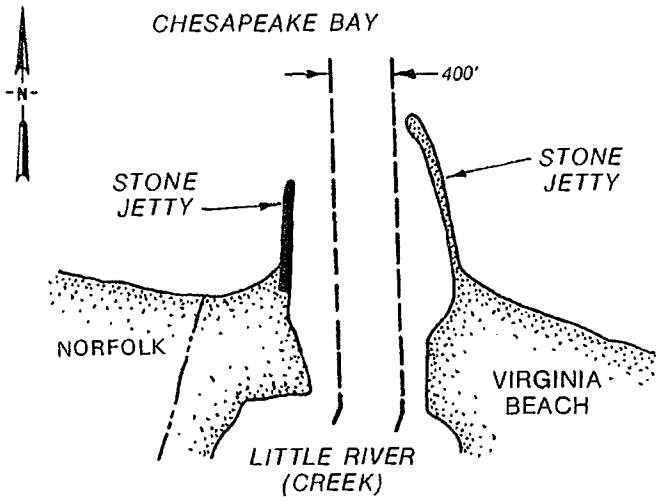


Figure 60. Jetties at the Little River (Creek) entrance

channel is 400 ft wide and 20 ft deep. The mean range of tide is about 2.6 ft.

(NOAA Nautical Chart No. 12222)

Tylers Beach, Virginia

74. Site 5i, jetties. The navigation project provides for two jetties to protect the entrance channel to the harbor of refuge (Figure 61). Located in Burwells Bay, the two stone revetment/jetty structures, each 370 ft long,

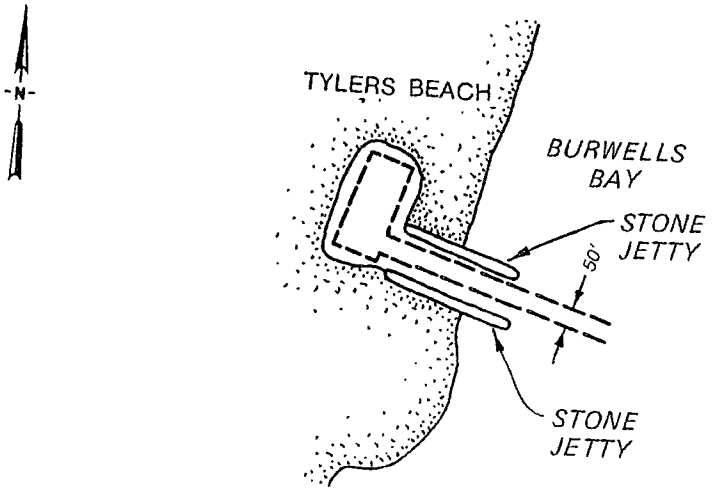


Figure 61. Tylers Beach entrance jetties

were constructed in 1982. The project channel is 50 ft wide and 6 ft deep. The mean range of tide is about 2.4 ft.

(NOAA Nautical Chart No. 12248)

Norfolk Harbor, Virginia

75. Site 5j has been disqualified from the inventory.

Cape Charles City Harbor, Virginia

76. Site 5k, jetty. The navigation project provides for a jetty to protect the harbor of refuge entrance (Figure 62). The jetty, which is about 1,400 ft long, is located on the north side of the harbor entrance from the Chesapeake Bay. The project channel is 500 ft wide and 18 ft deep. The mean range of tide is about 2.4 ft.

(NOAA Nautical Chart No. 12224)

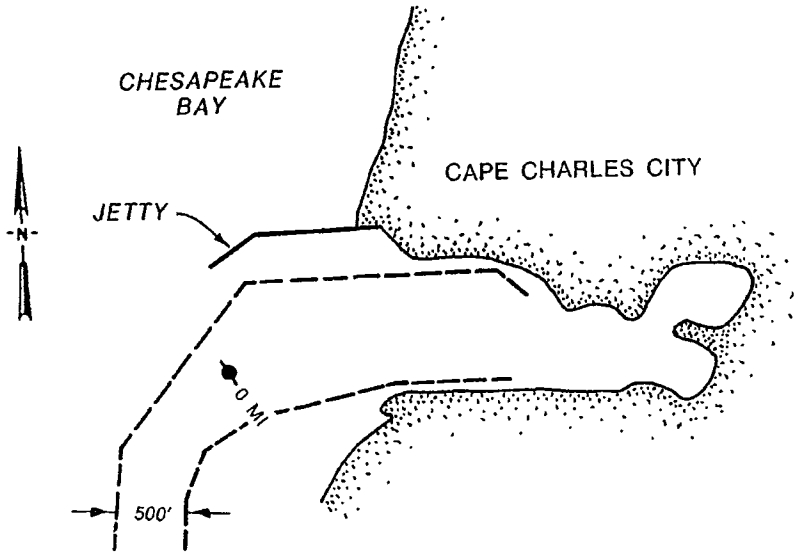


Figure 62. Cape Charles City Harbor entrance jetty

Appomattox River, Virginia

77. Site 5l, levee (barrier dike). The navigation project provides for a levee approximately 1.7 miles long on the ground between the navigation channel and a diversion channel (Figure 63). The purpose of the levee is to divert silt-laden floodwaters away from the navigation channel and into the

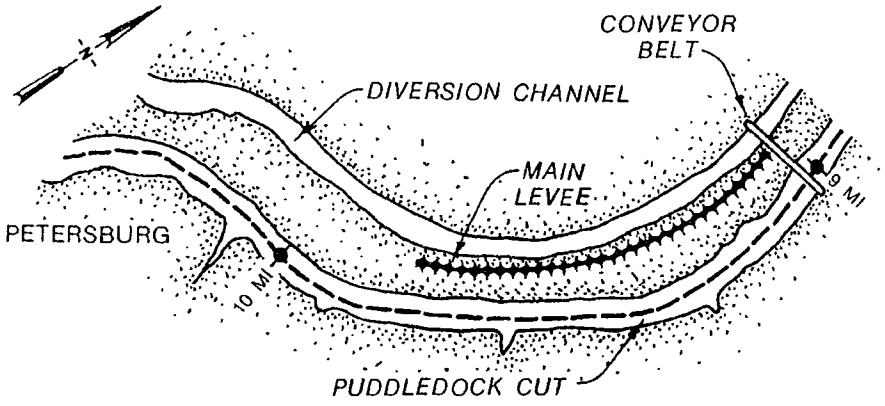


Figure 63. Diversion levee on the Appomattox River, Virginia diversion channel. The levee is about 1 mile east of the dam at Petersburg, which is the upstream limit of the Federal project. The project channel is 80 ft wide and 10 ft deep. The mean range of tide is about 2.9 ft at Petersburg.

(NOAA Nautical Chart No. 12251)

South Atlantic Division

Wilmington District

78. The Wilmington District lists four training structures, including training walls and jetties, within the District's jurisdiction (US Army Engineer District, Wilmington, 1981). The projects are located as indicated in Figure 64.

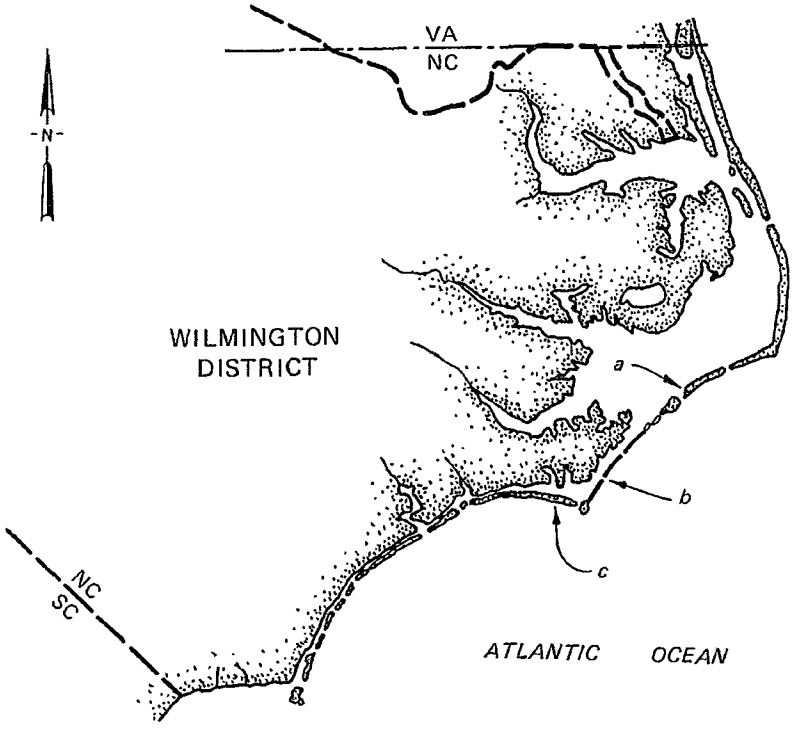


Figure 64. Location Plan 6, Wilmington District

Silver Lake Harbor, North Carolina

79. Site 6a, training wall (jetty). The navigation project, located on Ocracoke Island, provides for training walls on the north and south sides of the entrance channel to the basin in Silver Lake (Figure 65). The north wall is about 800 ft long and the south wall is about 400 ft long. The project entrance channel dimensions are 60 ft wide and 10 ft deep. The mean range of tide is about 1.9 ft.

(NOAA Nautical Chart No. 11550)

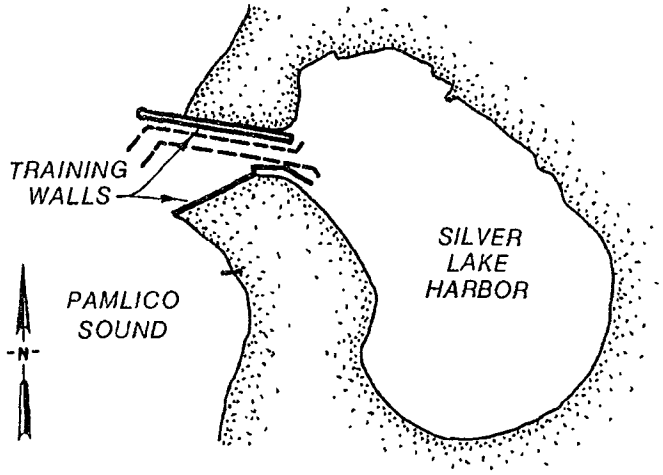


Figure 65. Silver Lake Harbor training walls

Cedar Island Bay, North Carolina

80. Site 6b, jetties. This area is a part of a larger navigation project, Waterway Connecting Pamlico Sound and Beaufort Harbor, North Carolina (Figure 66). The area of interest is the harbor near the Cedar Island Refuge in Cedar Island Bay. The project entrance channel, which is 70 ft wide and 7 ft deep, is protected by two parallel jetties. The jetty on the west side

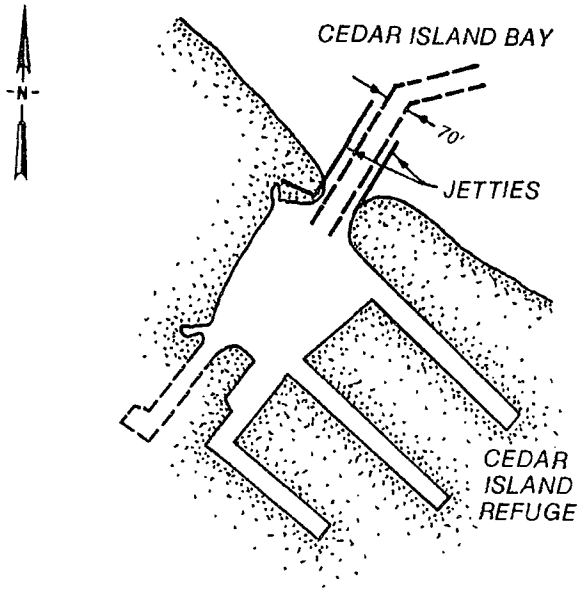


Figure 66. Cedar Island Refuge entrance jetties

is about 300 ft long and the east side jetty is about 200 ft long. The mean range of tide is not indicated.

(NOAA Nautical Chart No. 11550)

Beaufort Harbor, North Carolina

81. Site 6c, training wall (longitudinal dike). The training wall, which performs as a longitudinal dike, is located on the southern tip of Radio Island (Figure 67). The wall runs parallel to the Bulkhead Channel and is about 1,000 ft long. The adjacent navigation project channel is 100 ft wide and 15 ft deep. The mean range of tide is about 2.5 ft.

(NOAA Nautical Chart No. 11545)

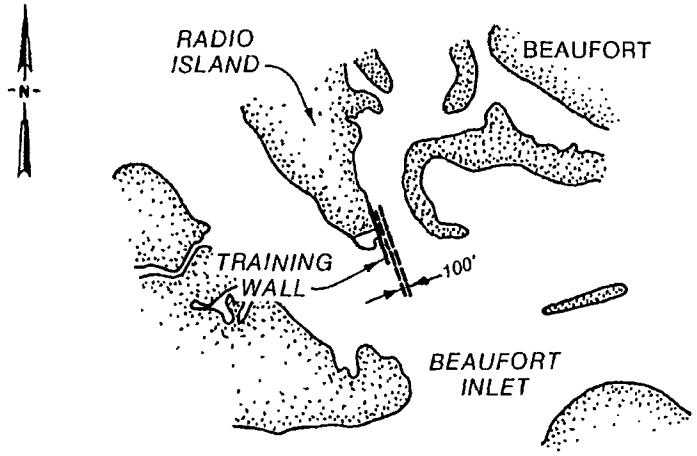


Figure 67. Beaufort Harbor training wall

South Atlantic Division

Charleston District

82. The Charleston District lists five training structures within the District's jurisdiction (US Army Engineer District, Charleston, 1976). The structures include dikes and training walls (Figure 68).

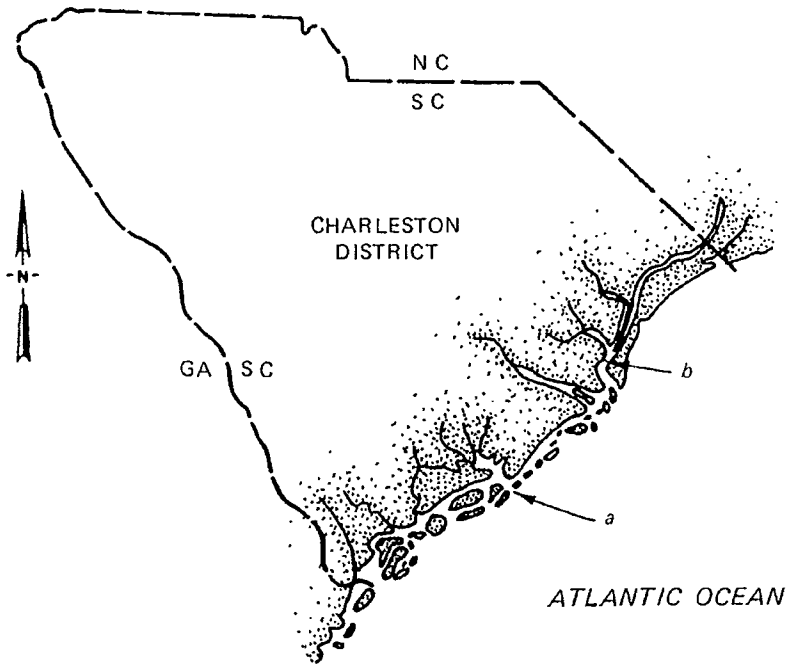


Figure 68. Location Plan 7, Charleston Distict

Charleston Harbor, South Carolina

83. Site 7a, dikes (lateral dikes). Three dikes are located in the Cooper River north of Drum Island between miles 8 and 10 (Figure 69). One of the dikes is on the left bank and one on the right near mile 8, and the third is on the left bank near mile 10. The project channel is about 600 ft wide and 35 ft deep, with deepening to 40 ft authorized in 1976. The mean range of tide is about 5.2 ft.

(NOAA Nautical Chart No. 11524)

Georgetown Harbor, South Carolina

84. Site 7b, training wall (longitudinal dike). The structure is

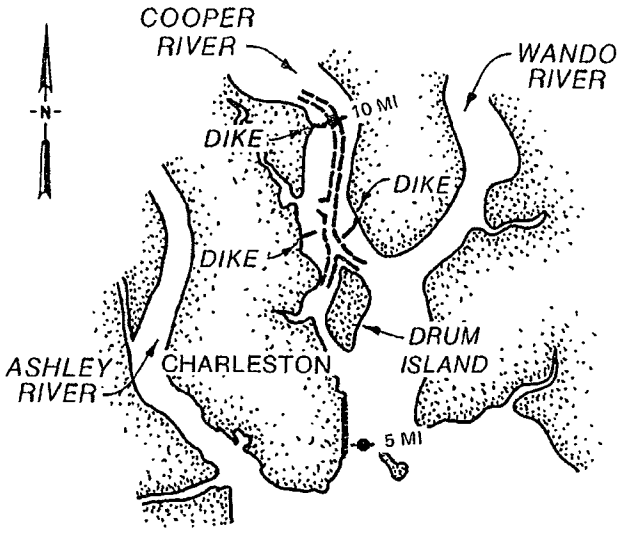


Figure 69. Dikes in Charleston Harbor

located in Winyah Bay south of Georgetown, and divides the west and east navigation channels (Figure 70). The structure begins at a shoaled island and extends north for about 7,500 ft, following a curvature similar to that of the west channel, which is a part of the Atlantic Intracoastal Waterway (AIWW). A shoal approximately 3,000 ft long is indicated opposite and to the east of the eastern channel. The structure also extends about 3,000 ft south from the island. The AIWW, or west channel, is 90 ft wide and 12 ft deep, and the east channel is 400 ft wide and 27 ft deep. The mean range of tide is about 4 ft.

(NOAA Nautical Chart No. 11532)

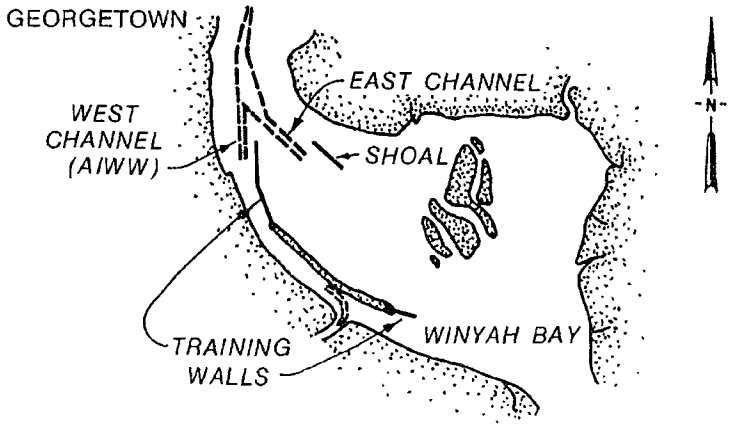


Figure 70. Georgetown Harbor training wall

South Atlantic Division

Savannah District

85. The Savannah District lists a jetty, several dikes, and a tide gate within the District's jurisdiction (US Army Engineer District, Savannah, 1985). The project locations are indicated in Figure 71.

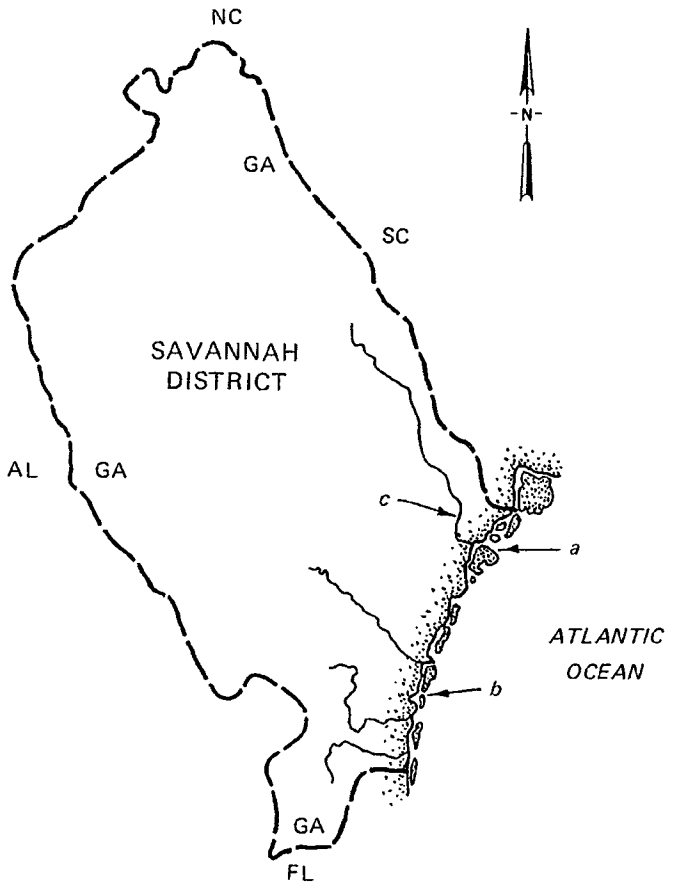


Figure 71. Location Plan 8, Savannah District

Savannah Harbor, Georgia

86. Site 8a, tide gate (barrier dike). The tide gate and sediment basin were authorized to be constructed in the Back River on 27 October 1965 (US 89th Congress, 1st Session). Because this work has been the subject of

Design Memoranda and other publications, the only reference made here is that of location (Figure 72).

(NOAA Nautical Chart No. 11512)

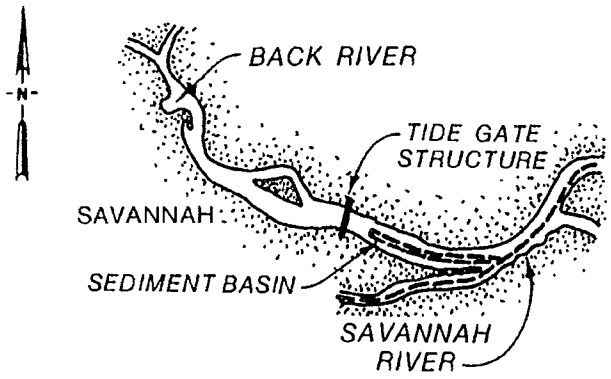


Figure 72. Savannah River tide gate

Brunswick Harbor, Georgia

87. Site 8b, jetty. The structure is located on the southern point of Andrews Island (Figure 73). The mean range of tide is about 7.3 ft in this location.

(NOAA Nautical Chart No. 11506)

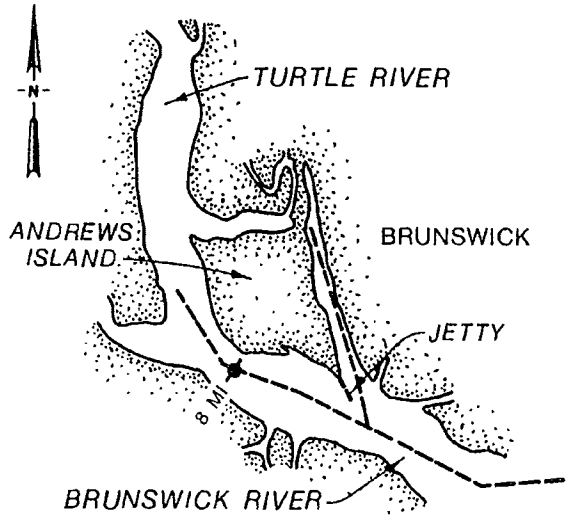


Figure 73. Brunswick Harbor jetty

Savannah River, Georgia

88. Site 8c, dikes (longitudinal and lateral dikes). Four dikes have been constructed in this reach of the Savannah River (Figure 74). Two longitudinal stone dikes were constructed near the Interstate 95 bridge at about mile 27.5, and two lateral timber pile dikes constructed at about mile 30.5.

(NOAA Nautical Chart No. 11514)

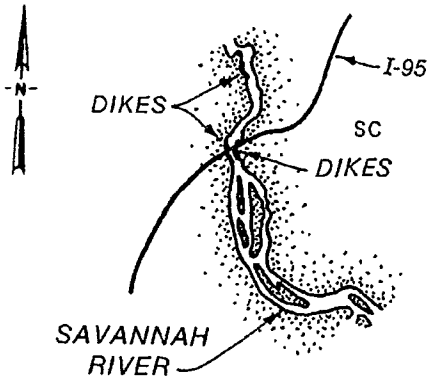


Figure 74. Dikes in the Savannah River

South Atlantic Division

Jacksonville District

89. The Jacksonville District lists 12 training structures of various types within the District's jurisdiction (US Army Engineer District, Jacksonville, 1979). The project locations are shown in Figure 75.

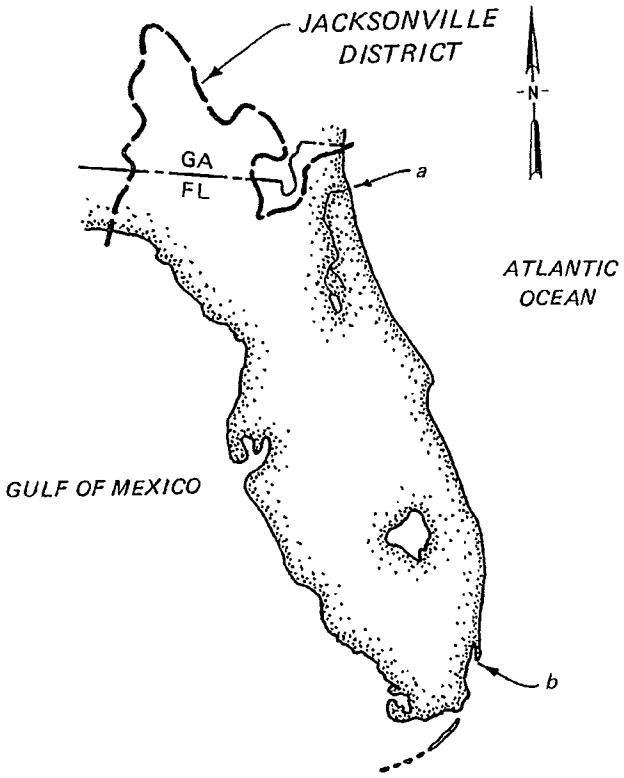


Figure 75. Location Plan 9, Jacksonville District

Jacksonville Harbor, Florida

90. Site 9a, training walls (longitudinal dikes). The control structure and a dike are located at mile 10 of the St. Johns River (Figure 76). The longitudinal dike was constructed parallel to the channel and on an island. The control structure is located in an opening to Mill Cove, in line with the dike. Six training walls and a jetty protect the navigation channel along river bends, but are not noted specifically in the report.

(NOAA Nautical Chart No. 11491)

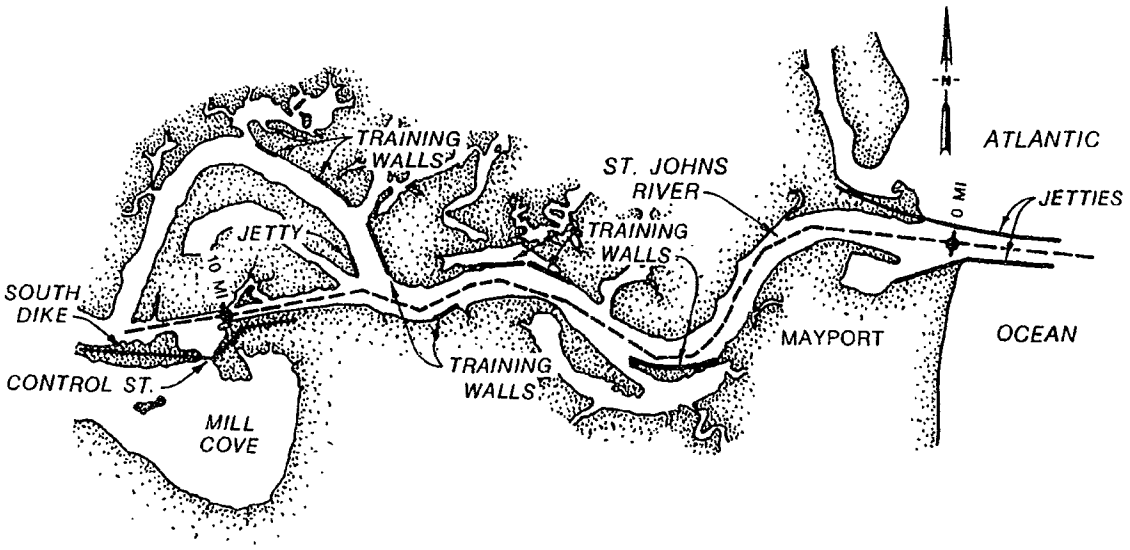


Figure 76. Training structures in the St. Johns River estuary

Coral Gables Waterway,
Miami Harbor, Florida

91. Site 9b, jetty. The structure is located at the Biscayne Bay entrance to the Coral Gables Waterway (Figure 77). Although not specifically noted on the map, the structure is shown on the north bank extending southeast into the bay about 900 ft.

(NOAA Nautical Chart No. 11468)

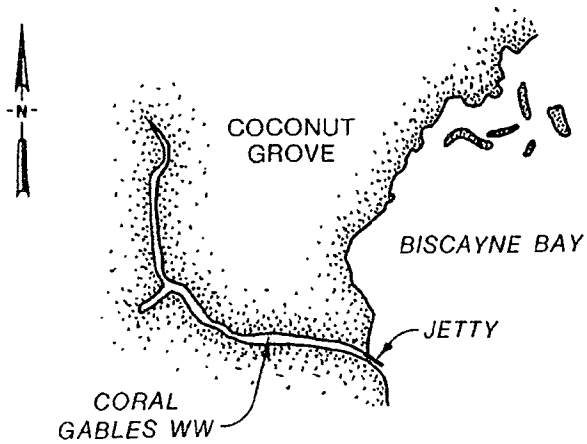


Figure 77. Coral Gables Waterway entrance jetty

South Atlantic Division

Mobile District

92. The Mobile District lists three jetties within the District's jurisdiction (US Army Engineer District, Mobile, 1982). The project locations are shown in Figure 78.

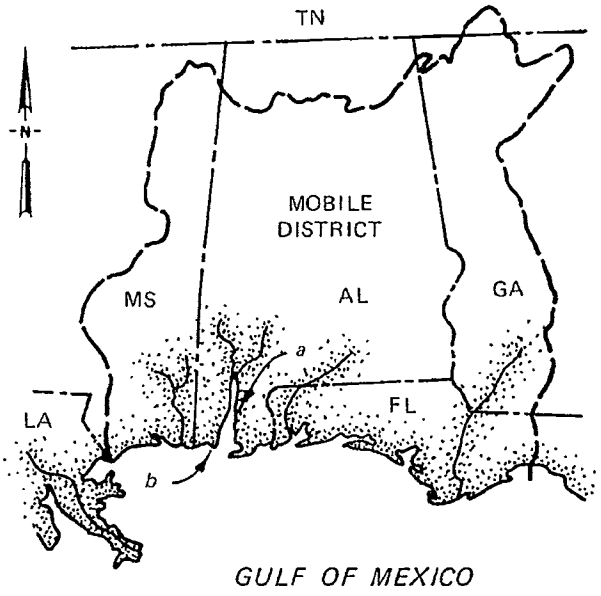


Figure 78. Location Plan 10, Mobile District

Fly Creek, Fairhope, Alabama

93. Site 10a, jetties. Two concrete and steel jetties were constructed to protect the harbor entrance channel (Figure 79). The north jetty is about 390 ft long and the south jetty is about 150 ft long, both extending west into Mobile Bay. The project navigation channel is 80 ft wide and 6 ft deep. The mean range of tide is 1.3 ft.

(NOAA Nautical Chart No. 11376)

Dauphin Island Bay, Alabama

94. Site 10b, jetty. The navigation project is located on the eastern tip of Dauphin Island in Mobile Bay, near Fort Gaines (Figure 80). The stone jetty, which protects the project entrance channel leading to Dauphin Island

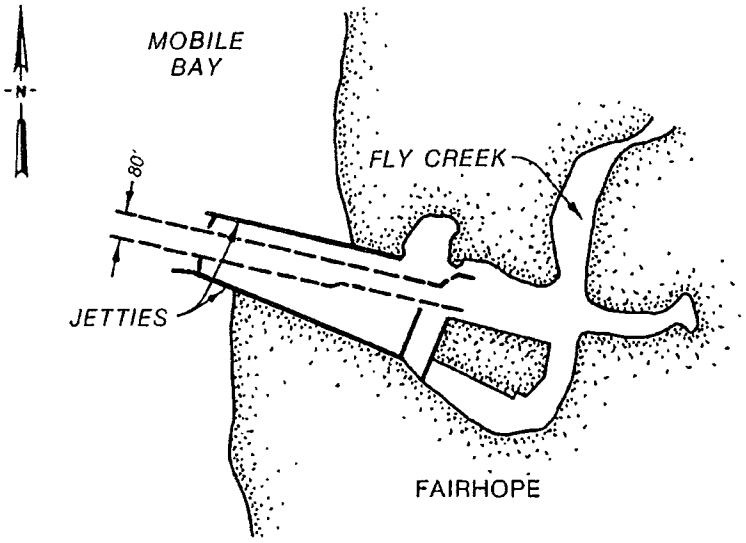


Figure 79. Fly Creek entrance jetties

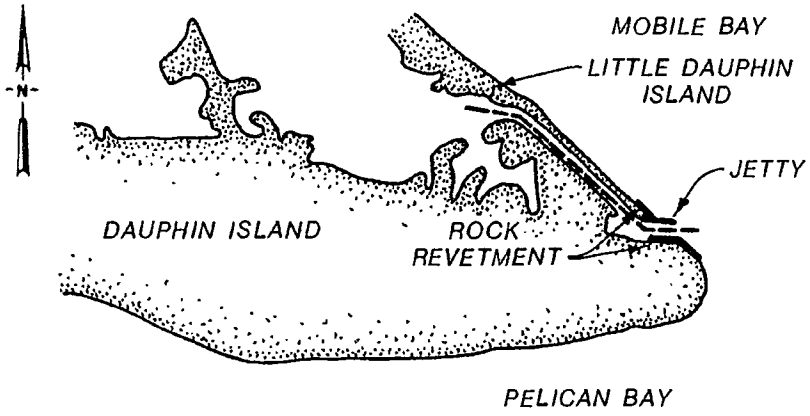


Figure 80. Dauphin Island Bay entrance jetty

Bay, is about 300 ft long. The project channel is 150 ft wide and 7 ft deep. The mean range of tide is 1.1 ft.

(NOAA Nautical Chart No. 11378)

Lower Mississippi Valley Division

New Orleans District

95. The New Orleans District lists numerous dikes in the Passes region of the Mississippi River (US Army Engineer District, New Orleans, 1982) (Figure 81).

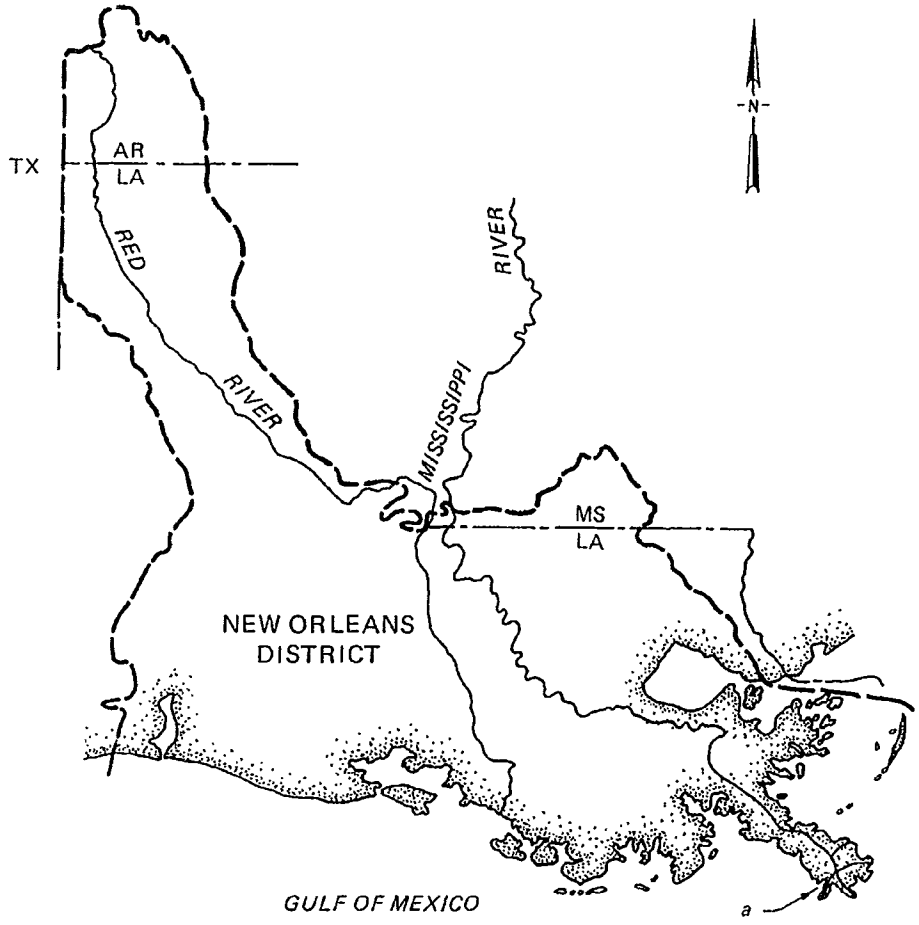


Figure 81. Location Plan 11, New Orleans District

Mississippi River, Louisiana

96. Numerous structures have been constructed in this estuary to help control shoaling in the navigation channel, including the following:

a. Site 11a, sills (submerged barrier dikes). Two submerged deflecting dikes were located within the entrance to Pass a Loutre (Figure 82); however, they were abandoned since they proved to be ineffective.

b. Site 11a, dikes (lateral dikes). Several dikes are located on the northeast bank of the Mississippi River between river miles 0 and 3.5 near the Head of Passes region (Figure 82).

c. Site 11a, headland structures (longitudinal dikes). Two headland dikes, constructed of timber piles, are located at the entrance of South Pass (Figure 82).

d. Site 11a, spur dikes (lateral dikes). Numerous timber pile dikes have been constructed in Southwest Pass and South Pass (Figure 82). Only the locations will be noted since current information is available.

(NOAA Nautical Chart No. 11361)

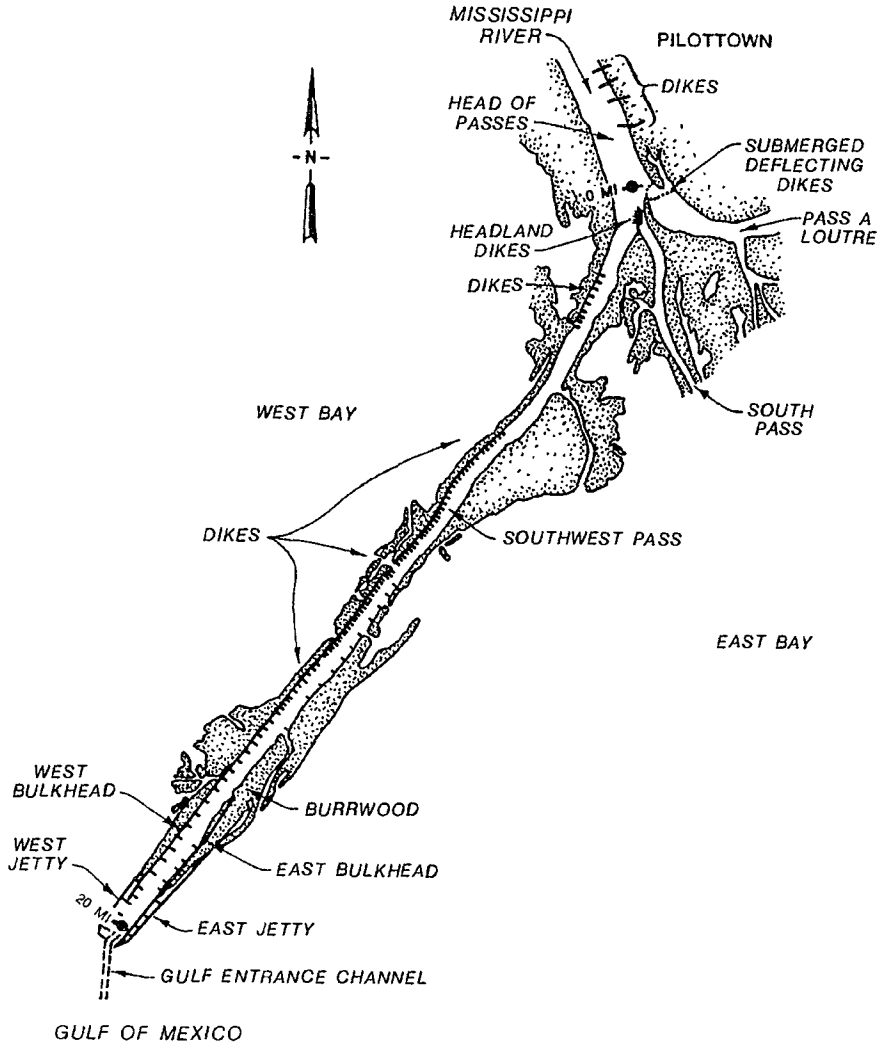


Figure 82. Training structures on the Mississippi River, South and Southwest Passes

Southwestern Division

Galveston District

97. The Galveston District lists 12 estuarine training structures within the District's jurisdiction (US Army Engineer District, Galveston, 1977). The locations of the projects are shown in Figure 83.

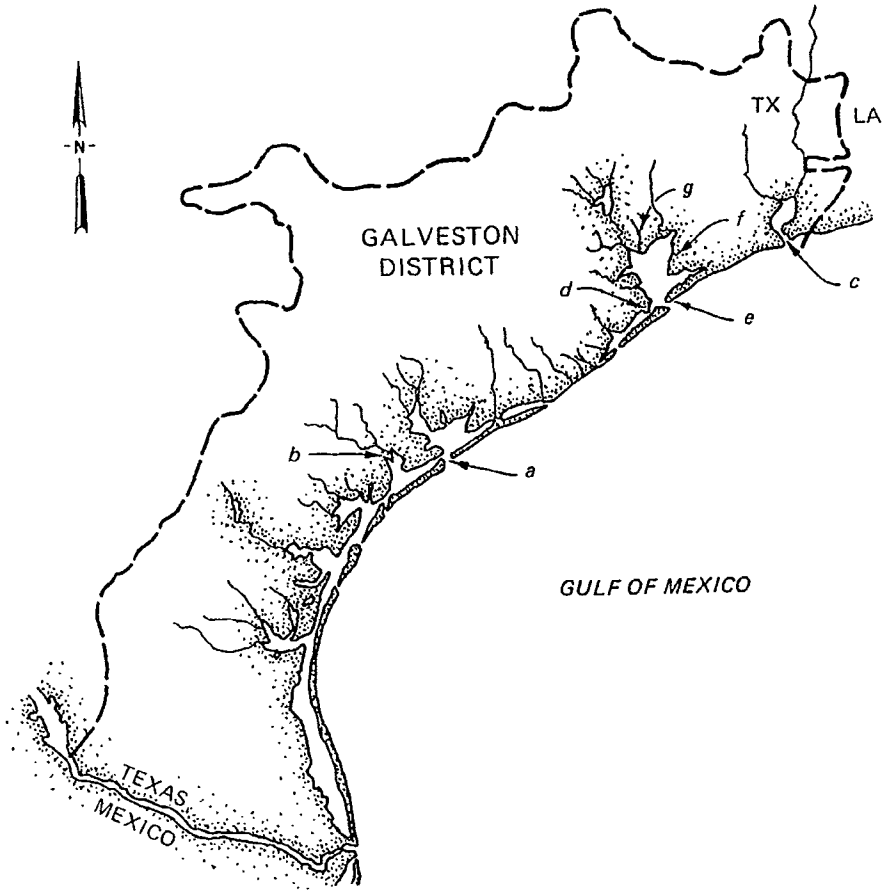


Figure 83. Location Plan 12, Galveston District

Port O'Connor, Texas

98. Site 12a, dikes (jetties). Two dikes that function as jetties protect the entrance channel of the Gulf Intracoastal Waterway (GIWW) in Matagorda Bay (Figure 84). The dikes consist of steel sheetpiling with shore and scour protection for 1,000 ft along the entrance, and rubble-mound dikes with a steel sheet core extending about 1,000 ft into the bay. The project

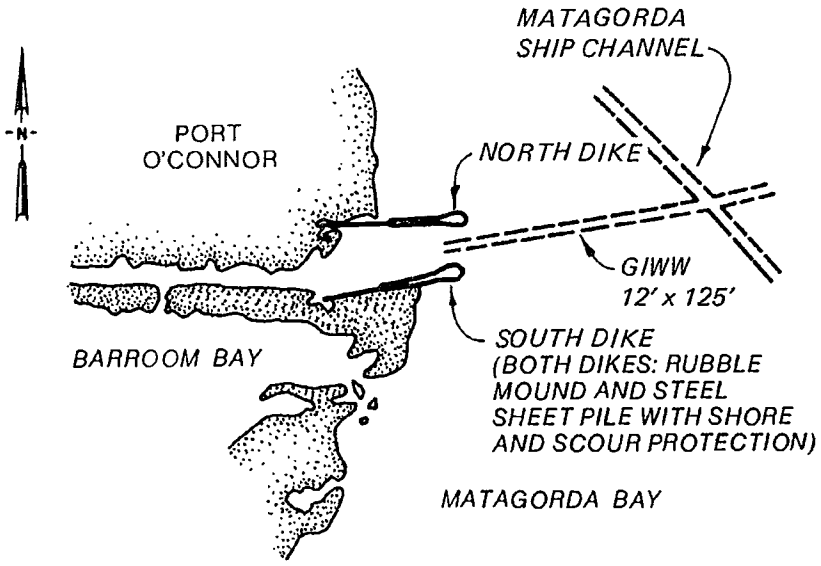


Figure 84. Dikes in Matagorda Bay

navigation channel in this area is 125 ft wide and 12 ft deep. The mean range of tide is about 2 ft.

(NOAA Nautical Chart No. 11317)

San Antonio Bay, Texas

99. Site 12b has been disqualified from the inventory.

100. Site 12c has been disqualified from the inventory.

Texas City Dike, Texas City, Texas

101. Site 12d, dike (barrier dike). The navigation project, which is located in south Galveston Bay, provides for a dike to reduce shoaling in the Texas City Channel (Figure 85). The dike, which runs parallel to and north of the channel, consists of a timber dike 28,200 ft long and a rubble-mound dike 27,600 ft long parallel to and south of the timber dike. The project channel in this area is 400 ft wide and 40 ft deep. The mean range of tide is about 1.3 ft.

(NOAA Nautical Chart No. 11324)

Port Bolivar, Texas

102. Site 12e, dike (jetty). The navigation project is located at the

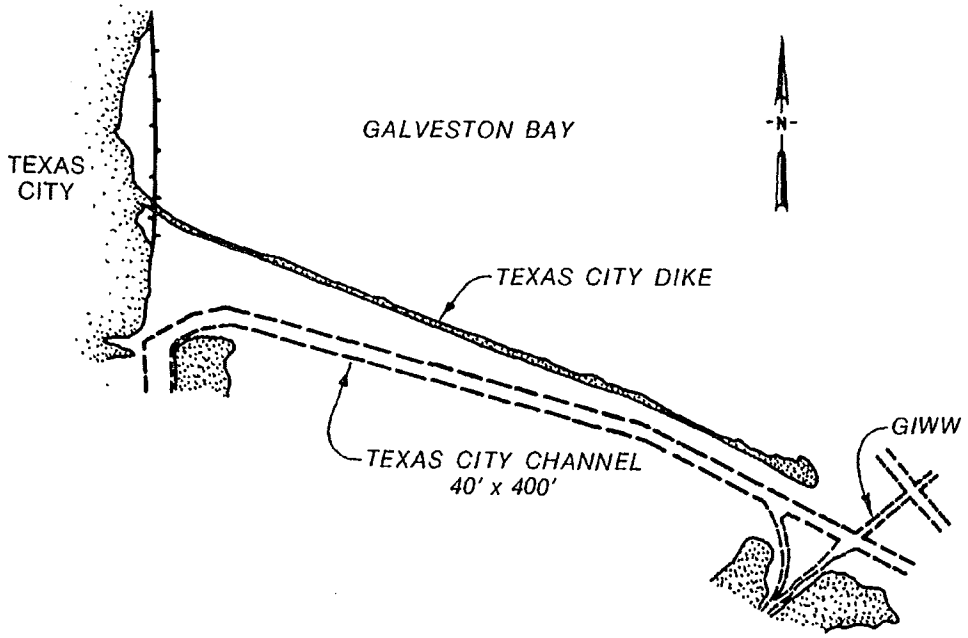


Figure 85. Texas City Dike, Texas City

east entrance of the GIWW into Galveston Bay (Figure 86). A steel sheet-pile and stone dike, which acts as a combination of a jetty and longitudinal dike, protects the northern point. The dike extends about 1,000 ft into the bay to

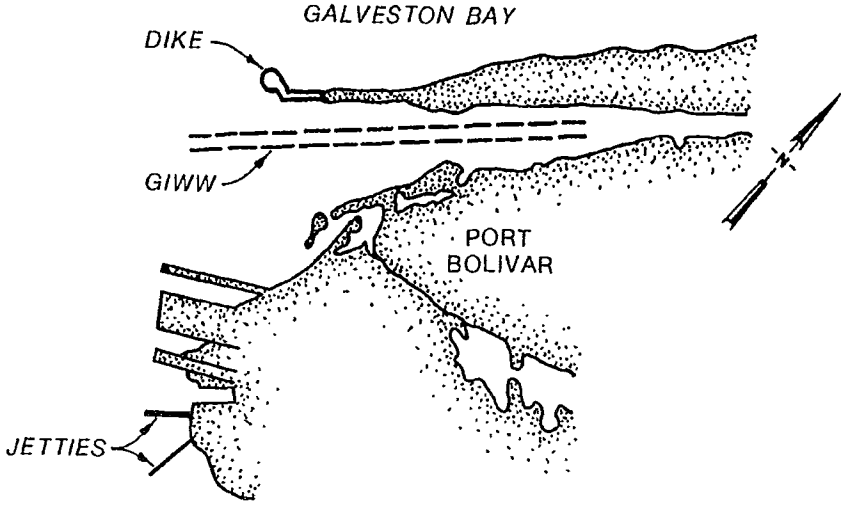


Figure 86. Dike in Galveston Bay near Port Bolivar

the southwest. The project channel is 300 ft wide and 12 ft deep. The mean range of tide is about 1 ft.

(NOAA Nautical Chart No. 11324)

Trinity Bay (Channel to Liberty near Double Bayou, Texas)

103. Site 12f, earth dam (barrier dike). An earth dam is indicated in the Channel to Liberty, in northeast Trinity Bay near Anahuac (Figure 87). The navigation project channel dimensions in this area are 150 ft wide and 9 ft deep. The mean range of tide is about 0.6 ft in this area of Trinity Bay.

(NOAA Nautical Chart No. 11326)

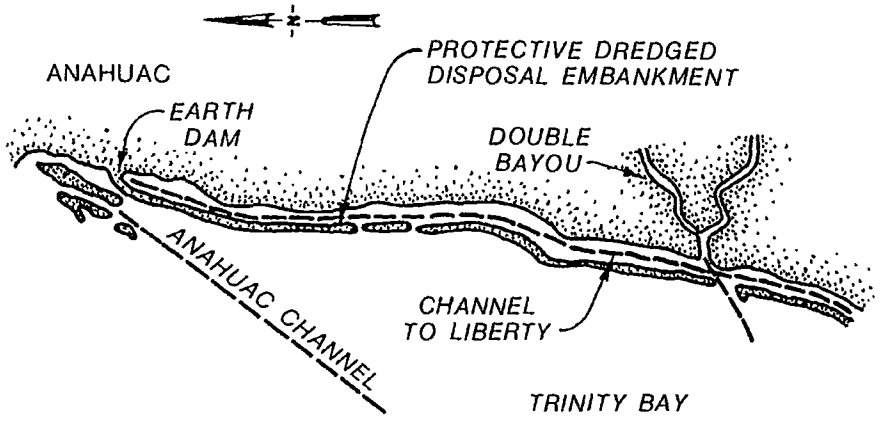


Figure 87. Earth dam in the Channel to Liberty

Cedar Bayou, Texas

104. Site 12g, submerged jetties. The navigation project is located in Galveston Bay (Figure 88). Submerged brush and stone jetties are indicated in the entrance of the old Cedar Bayou Channel which was completed in 1931. The jetties extend from mile 0 in the bay to mile 0.7 at the old entrance of the Cedar Bayou Channel. Realignment in this area was completed in 1975. The new project channel in this area is 100 ft wide and 10 ft deep. The mean range of tide is 0.6 ft.

(NOAA Nautical Chart No. 11328)

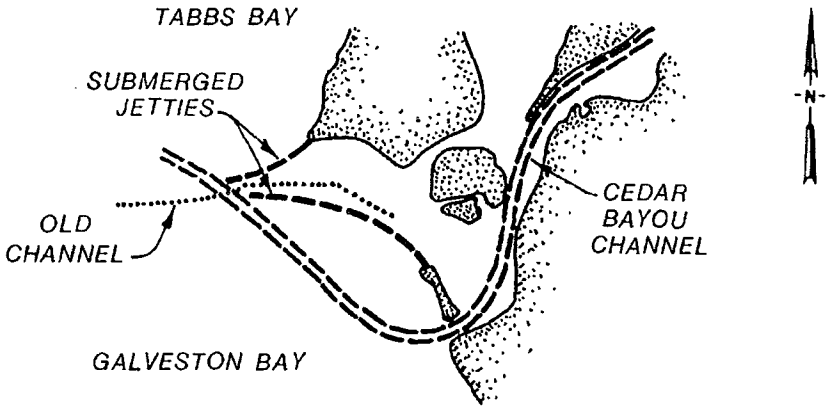


Figure 88. Submerged jetties in the Cedar Bayou Channel

South Pacific Division
San Francisco District

105. The San Francisco District lists several training structures, including a training wall, groin, and jetties (US Army Engineer District, San Francisco, 1984). The project locations are indicated in Figure 89.

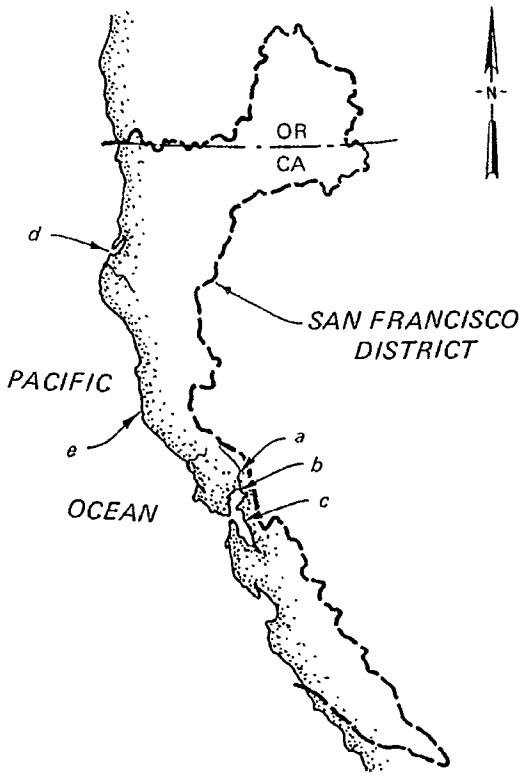


Figure 89. Location Plan 13,
San Francisco District

Napa River, California

106. Several structures are noted for this project, including the following:

a. Site 13a, dikes (jetties and lateral dikes). Located in upper San Pablo Bay, two jetties protect the mouth of the river (Figure 90).

b. Site 13a, dike (longitudinal dike). The navigation project covers the channel from mile 0 at Vallejo to mile 16 in Napa (Figure 90). The description calls for dikes and revetments in "difficult areas"; however, it does not indicate where

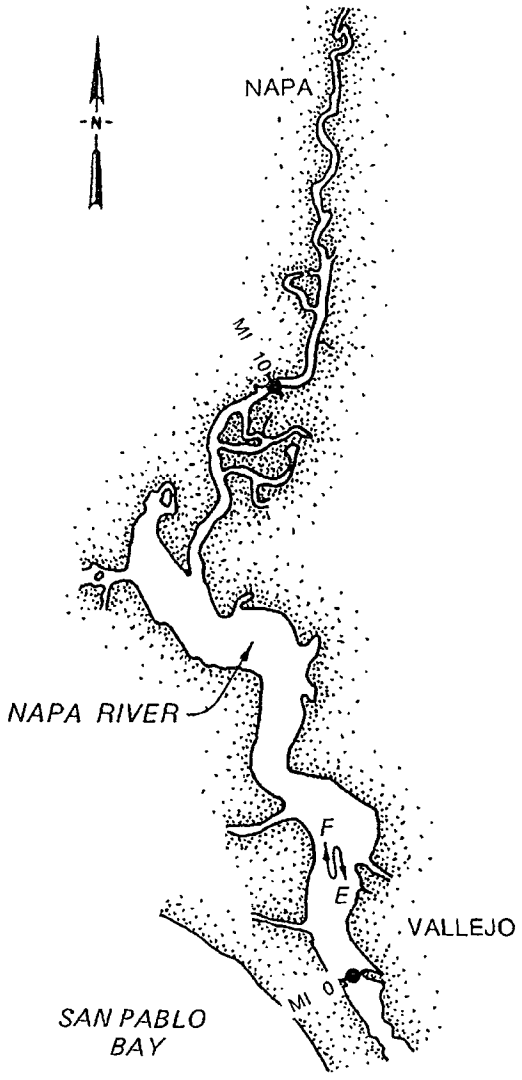


Figure 90. Napa River, California

these areas are. One longitudinal dike is indicated in upper San Pablo Bay.

(NOAA Nautical Chart No. 18654)

Richmond Harbor, San Francisco Bay, California

107. Site 13b, training wall (longitudinal dike). The Richmond Outer Harbor Training Wall extends 10,000 ft west from Brooks Island in San Francisco Bay (Figure 91). The wall was constructed in 1923 and later extended in 1931 to the present length. Subsidence was corrected by rehabilitation of the

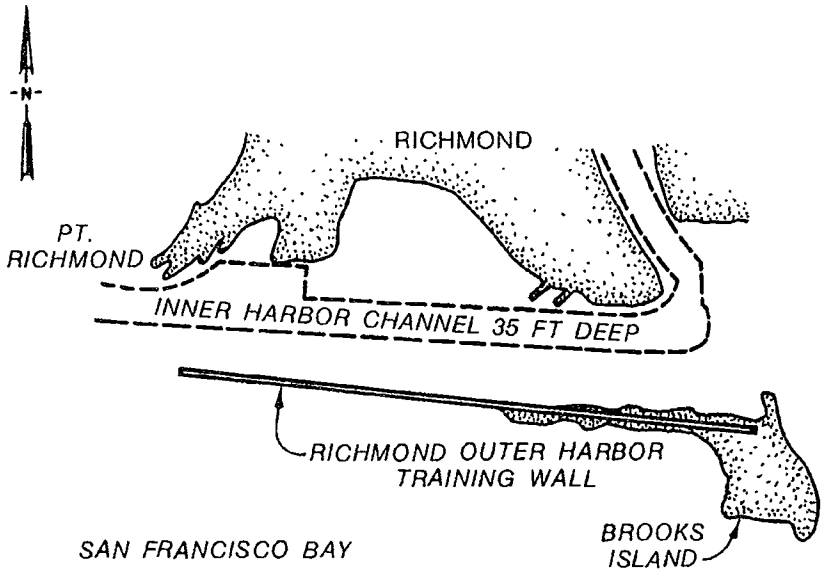


Figure 91. The Richmond Outer Harbor Training Wall

outer 3,000 ft in 1967 and 1985. The wall was constructed to direct tidal currents, lessen channel dredging, and protect vessels in the harbor from southerly storms. The project inner harbor channel varies from 500 to 600 ft wide and is 35 ft deep. The mean range of tide is 5.8 ft.

(NOAA Nautical Chart No. 18649)

Oakland Harbor,
San Francisco Bay, California

108. Site 13c, jetties. The navigation project provides for two rubble-mound parallel jetties to protect the inner harbor entrance channel (Figure 92). The north jetty is 9,500 ft long and the south jetty is 12,000 ft long. The project channel is 600 ft wide and 35 ft deep. The mean range of tide is about 6.3 ft.

(NOAA Nautical Chart No. 18650)

Humboldt Harbor and Bay, California

109. Site 13d, groin and breakwater (barrier dike). The project is a special shore protection demonstration study which provides for a groin and a rubble-mound breakwater to protect the Buhne Point Shore from erosion (Figure 93). The groin (timber, rock, and concrete diaphragm) is 1,825 ft long and has reduced maintenance dredging in the adjacent Field Landing Channel.

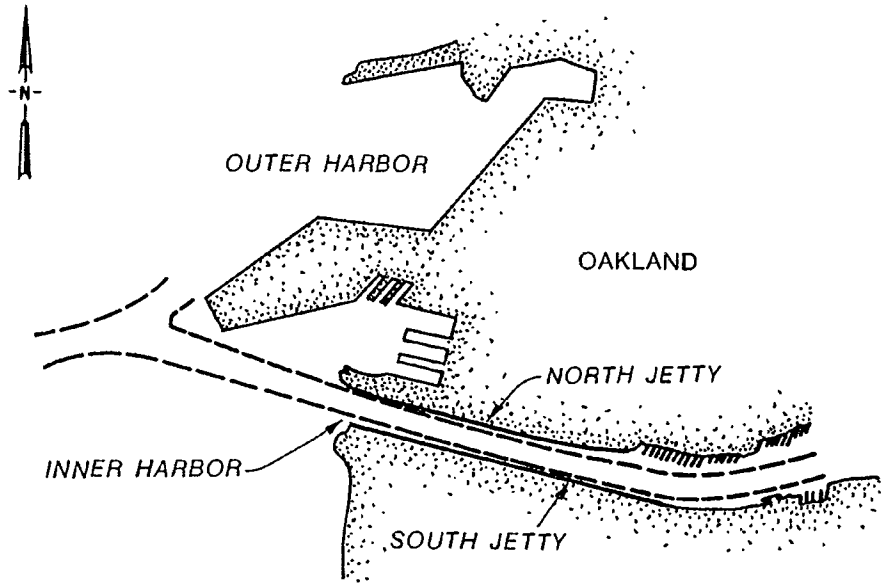


Figure 92. Jetties in Oakland Harbor

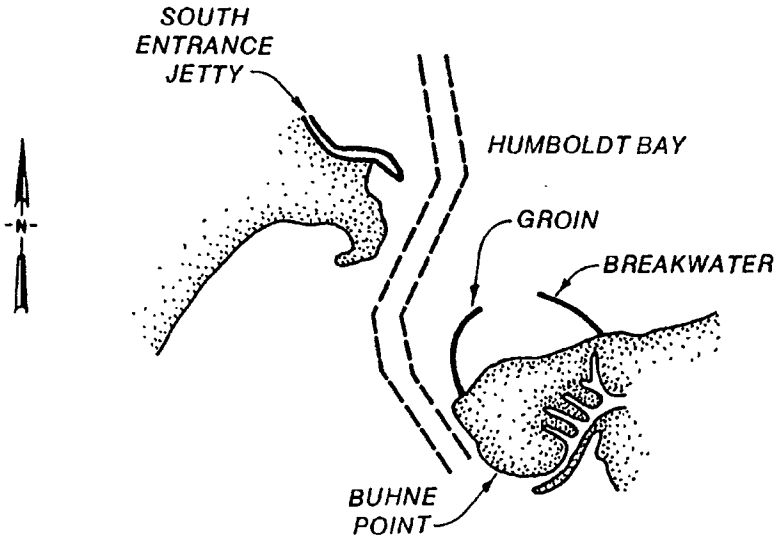


Figure 93. Groin and breakwater at Buhne Point, Humboldt Bay

The rubble-mound breakwater is 1,100 ft long. The mean range of tide is about 6.4 ft.

(NOAA Nautical Chart No. 18622)

Noyo River and Harbor, California

110. Site 13e, jetties and walls (jetties). The project provides for two concrete jetties and walls to protect the entrance channel (Figure 94). The north jetty and wall are 620 ft and the south jetty (wall) is 234 ft in length. The project channel is 100 to 150 ft wide and 10 ft deep. The mean range of tide is about 5.8 ft.

(NOAA Nautical Chart No. 18626)

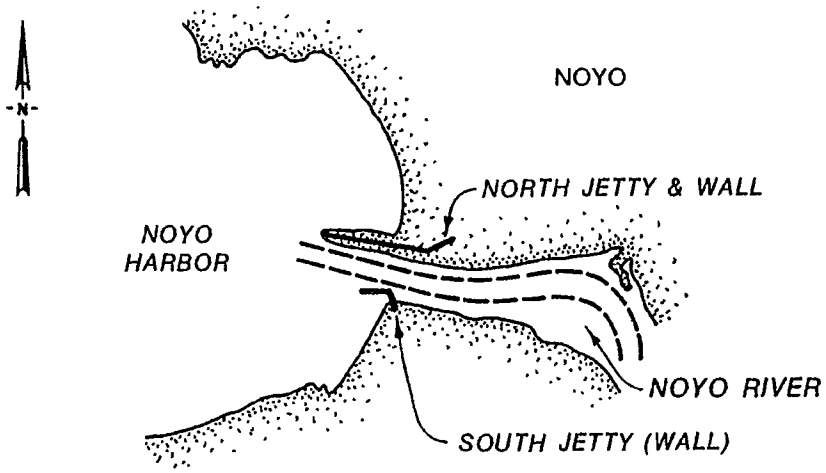


Figure 94. Entrance jetties in Noyo Harbor

North Pacific Division

Portland District

111. The Portland District lists several hundred training structures within the District's jurisdiction (US Army Engineer District, Portland, 1973). The structures include mainly timber pile dikes with a few stone dikes and jetties (Figure 95).

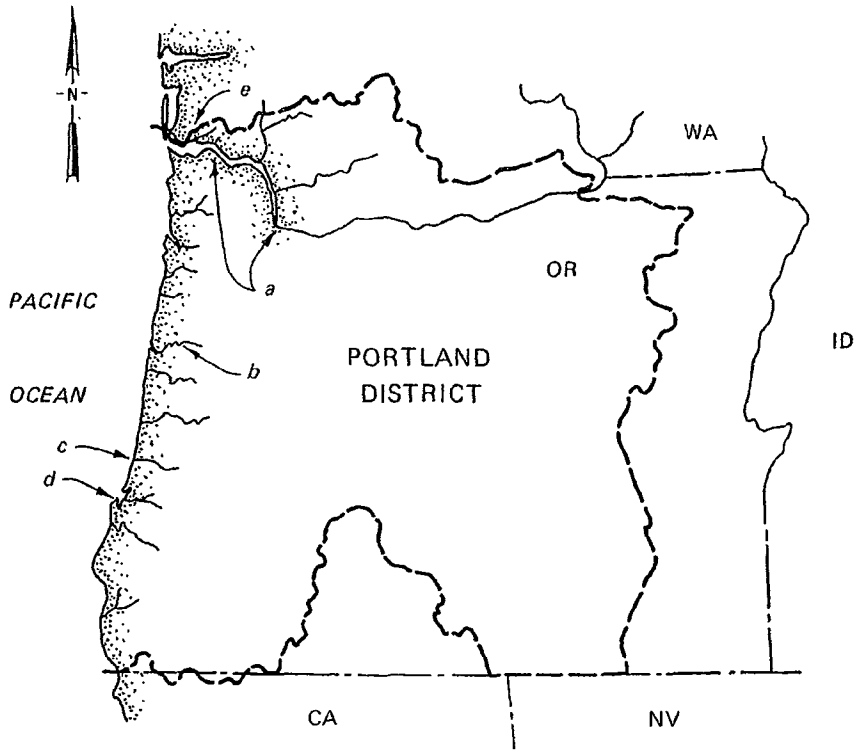


Figure 95. Location Plan 14, Portland District

Columbia River, Oregon

112. The following structures are noted for this project:

a. Site 14a.1, dikes (lateral dikes). The navigation project, Oregon Slough, is located at river mile 102 where the channel serves North Portland Harbor (Figure 96). Nine spur dikes are indicated on north and south banks of the slough between miles 0 and 3. The project channel is 200 ft wide and 20 ft deep. The mean range of tide is 2 ft at low stage.

(NOAA Nautical Chart No. 18526)

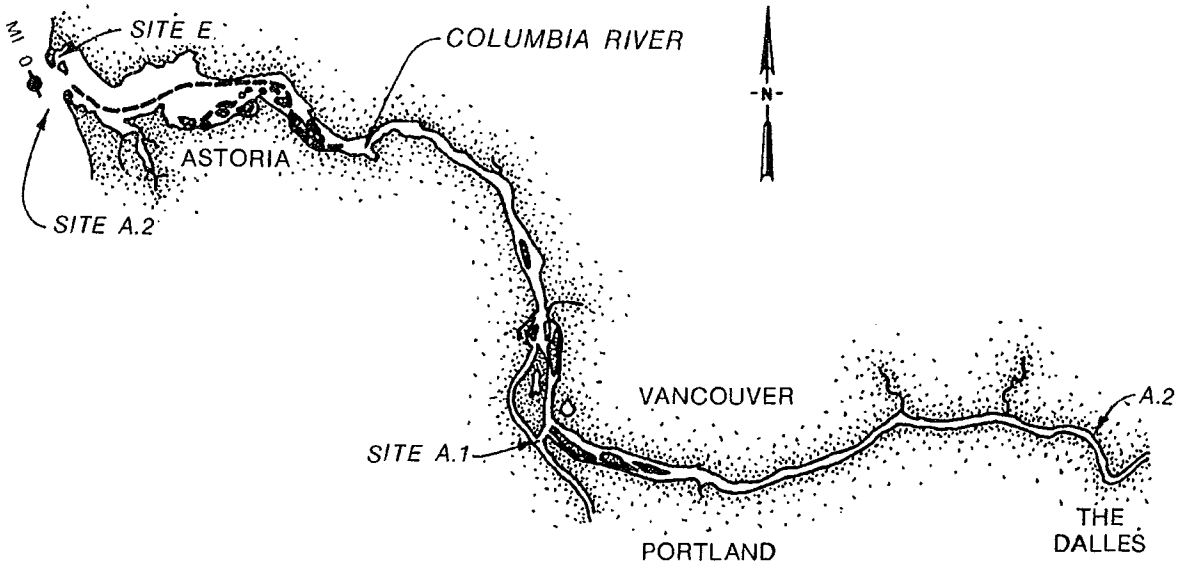


Figure 96. General location of dikes on the Columbia River

b. Site 14a.2, lower Columbia River dikes (lateral dikes). The area covered by this navigation project extends from mile 0 at the mouth of the Columbia River, to mile 145 at The Dalles, Oregon, and includes about 246 timber pile dikes (Figure 96). Only the general location is given in this inventory for these structures.

(NOAA Nautical Chart Nos. 18521 and 18531)

Yaquina River near Toledo, Oregon

113. Site 14b, submerged dikes (lateral dikes). The navigation project provides for two half-tide dikes located near river miles 11 and 13.5 (Figure 97). The project channel in this area is 150 ft wide and 10 ft deep. The mean range of tide is about 8 ft.

(NOAA Nautical Chart No. 18581)

Umpqua River, Oregon

114. Site 14c, training jetty (longitudinal dike). The project includes a training jetty, about 3,500 ft long on the south side of the entrance (Figure 98). Completed in 1951, the jetty begins at mile 0 and curves to the

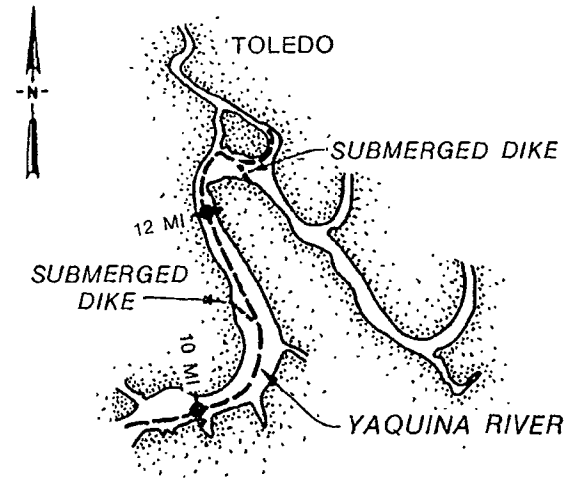


Figure 97. Submerged dikes in the Yaquina River

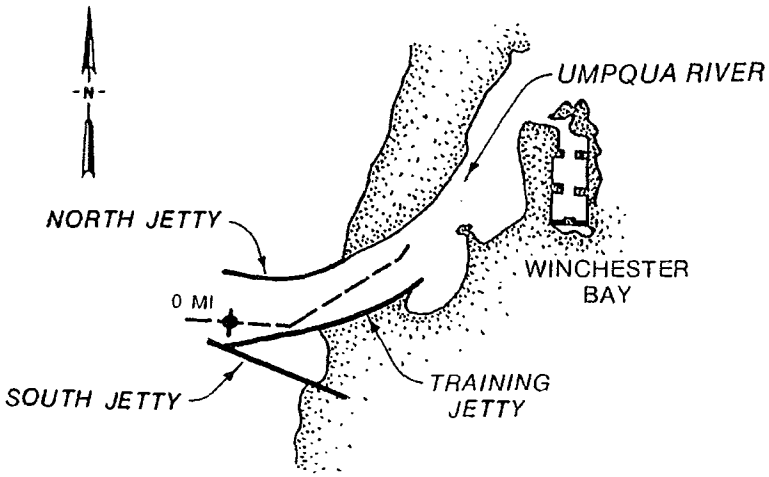


Figure 98. Umpqua River training jetty

northeast parallel to and south of the channel. The project navigation channel is 200 ft wide and 22 ft deep. The mean range of tide is 6.9 ft.

(NOAA Nautical Chart No. 18584)

Coos Bay, Oregon

115. Site 14d, dikes (lateral dikes). The project includes five dikes that are located on the northern bank between miles 6 and 7.5 (Figure 99). The navigation channel in this area is 300 ft wide and 35 ft deep. The

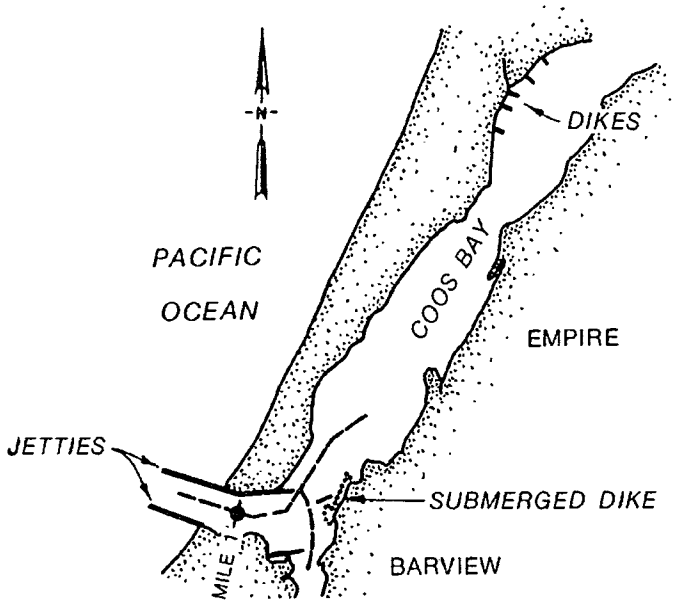


Figure 99. Dikes in Coos Bay

project also includes a submerged dike near mile 2 on the east bank (north of Barview). The project channel extension in this area is 150 ft wide and 10 ft deep. The mean range of tide at the entrance is about 7 ft.

(NOAA Nautical Chart No. 18587)

Baker Bay, Oregon

116. Site 14e, dikes (lateral dikes). The navigation project included the construction of four spur dikes on the western side of Sand Island in the channel leading to the Port of Ilwaco (Figure 96). The western project channel is 150 ft wide and 10 ft deep. The mean range of tide is about 8 ft.

(NOAA Nautical Chart No. 18521)

North Pacific Division

Seattle District

117. The Seattle District lists almost 20 training structures within the District's jurisdiction (US Army Engineer District, Seattle, 1982). The structures include dikes, jetties, walls, and a sill (Figure 100). (Several structures are in poor condition and may no longer exist.)

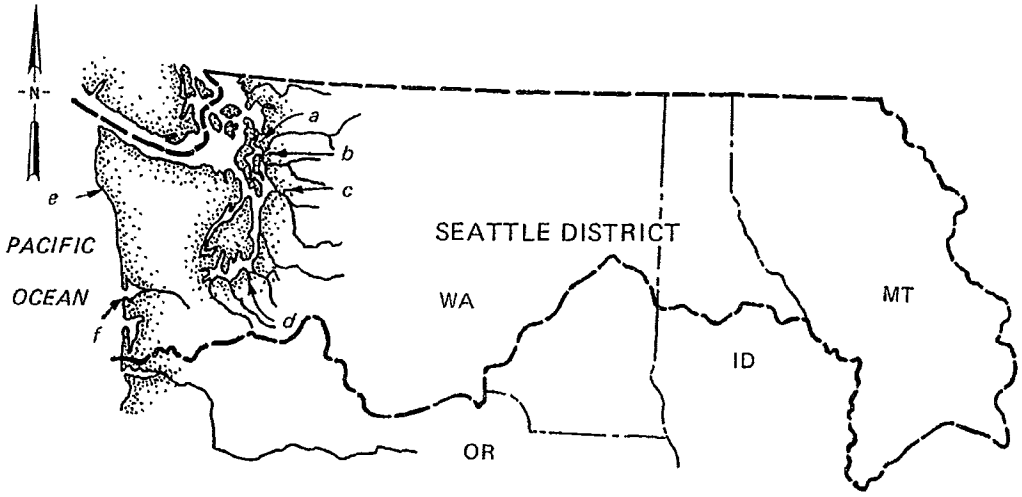


Figure 100. Location Plan 15, Seattle District

Swinomish Channel, Washington

118. Site 15a, jetties and dikes (barrier and longitudinal dikes). The Swinomish Channel navigation project provides for a 100-ft-wide by 12-ft-deep channel from Saratoga Passage, in Skagit Bay, to deep water in Padilla Bay (Figure 101). The Saratoga entrance jetties extend from land at about mile 2 with the north jetty projecting southwest to about mile 1.5 and the south jetty reaching almost to mile 0. Also located in the entrance at mile 3 are two longitudinal dikes paralleling the project channel on opposite sides. The mean range of tides in Skagit Bay is about 7 ft.

(NOAA Nautical Chart No. 18427)

Skagit River, Washington

119. Site 15b, sill, closure and training dikes (barrier and longitudinal dikes). The navigation project provides an entrance channel to the branched network of the Skagit River (Figure 102). The construction of the

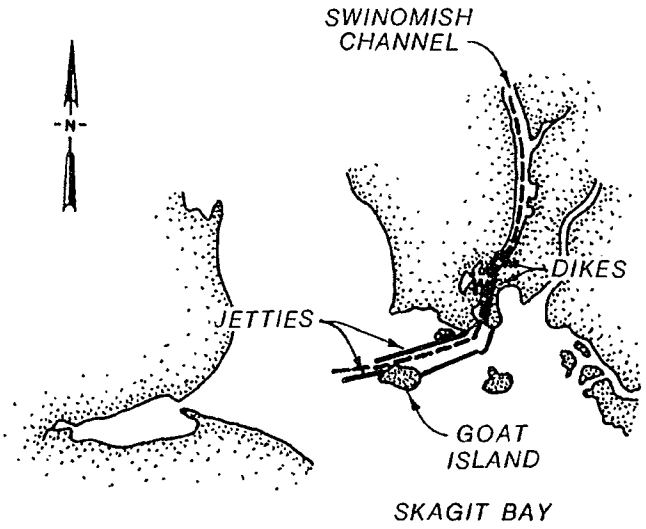


Figure 101. Training structures in the Swinomish Channel

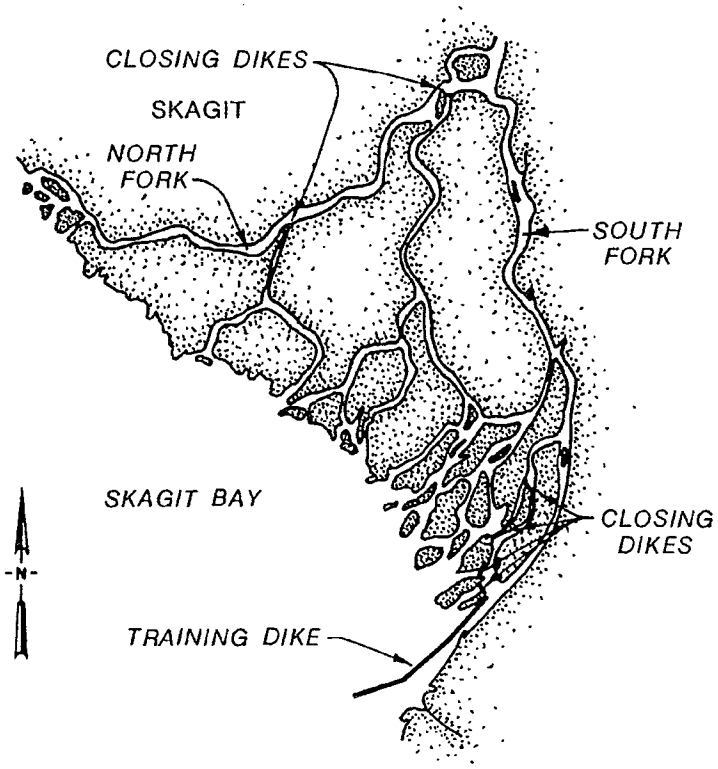


Figure 102. Training structures in the Skagit River

10,450-ft-long training dike at the entrance, a mattress sill near the head of the North Fork, and several closure dikes was completed in 1911. The mattress sill became a hazard to navigation and was removed. The remaining structures are noted to be in poor condition. The training dike was not completed to the authorized length of 16,000 ft. Portions of the project were deauthorized in 1978. The mean range of tide is about 8 ft.

(NOAA Nautical Chart No. 18400)

Snohomish River, Everett Harbor, Washington

120. Site 15c, training dikes, spur dikes, and pile wall (longitudinal and lateral dikes). The navigation project provides for a training dike parallel to the entrance channel (Figure 103). The dike extends 12,550 ft north from mile 0, and ends at the Gap with a 400-ft-long spur dike. Completed in 1963, the lower 3,250 ft required rehabilitation in 1974. Other structures authorized in the project include a spur dike, 1,410 ft long, and a

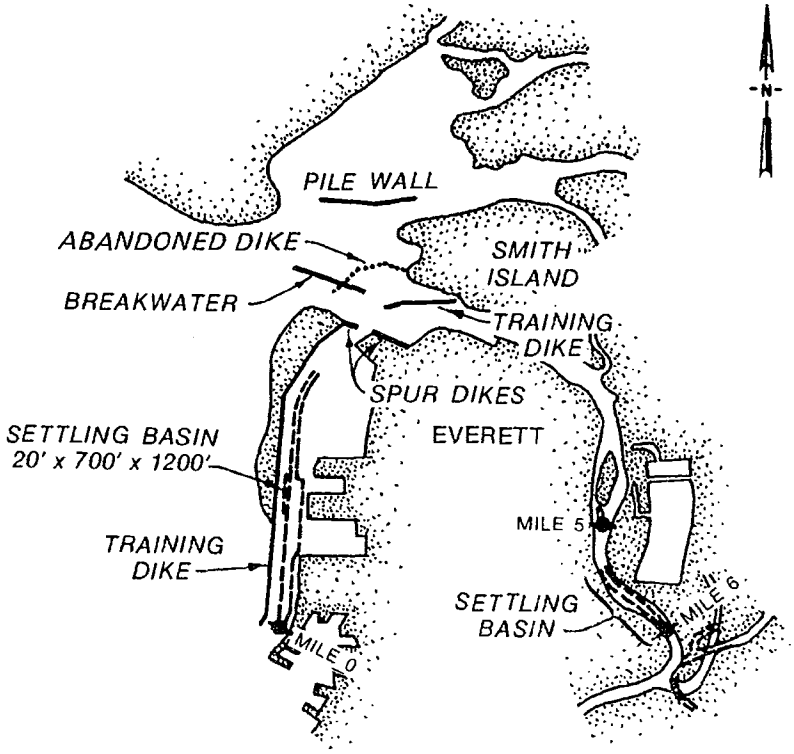


Figure 103. Everett Harbor training structures

training dike, both located at the Gap. A breakwater and abandoned dike are located northwest of the Gap, and a pile wall is indicated to the north in an embayment. The project navigation channel is 150 ft wide and 8 ft deep. The mean range of tide is 7.4 ft.

(NOAA Nautical Chart No. 18444)

Puyallup River, Tacoma Harbor, Washington

121. Site 15d, training walls (jetties). The navigation project provides for the construction of two training walls at the mouth of the Puyallup River (Figure 104). The walls are each about 700 ft long; the west wall is constructed of rock and the east wall of timber piling. The mean range of tides is about 8 ft.

(NOAA Nautical Chart No. 18253)

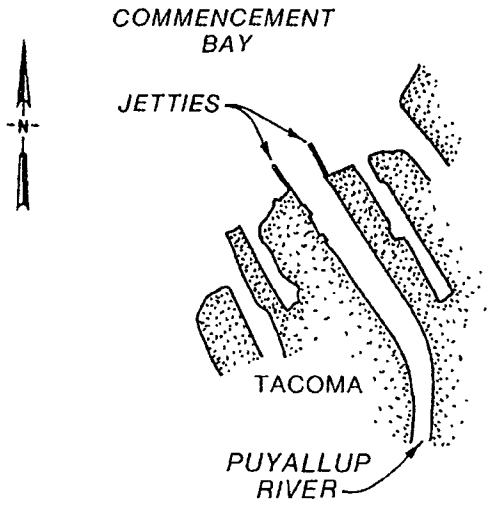


Figure 104. Tacoma Harbor training walls

Quillayute River, Washington

122. Site 15e, dike and training wall (longitudinal dikes). The navigation project provides for a dike with groins on the westerly side of the

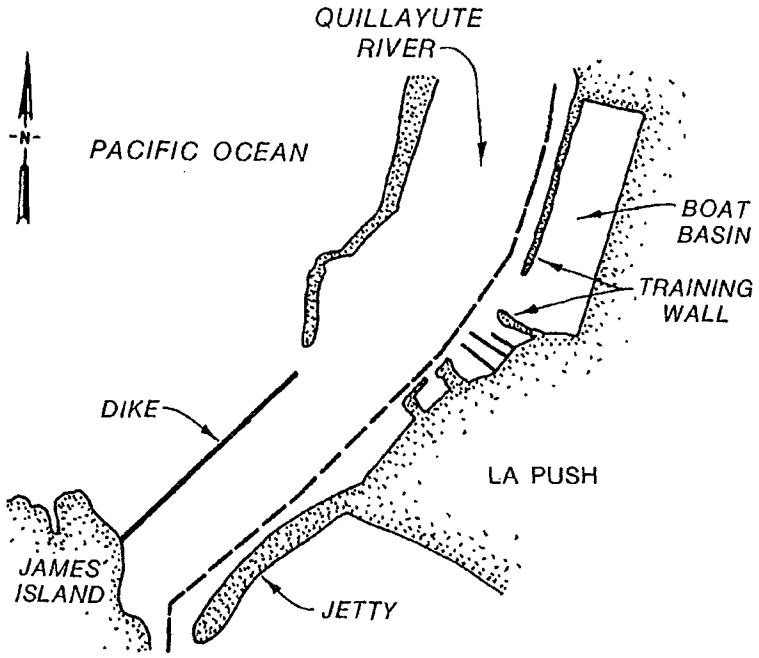


Figure 105. Quillayute River training structures

mouth of the Quillayute River (Figure 105). The dike, 1,050 ft long, was completed in 1960; however, the groins were considered unnecessary and not constructed. A jetty was also constructed on the opposite side of the navigation channel at the same time. The project navigation channel at the mouth is 100 ft wide and 10 ft deep. To lessen maintenance dredging in the boat basin north of the river mouth, a riprap training wall was constructed in 1982 and has been successful. The mean range of tides in the area is about 6.5 ft.

(NOAA Nautical Chart No. 18480)

Grays Harbor, Point Chehalis, Oregon

123. Site 15f, groins (lateral dikes). The navigation project provides for the protection of revetment by groins (Figure 106). The six groins not only protect against wave action and trap some sediments, but most importantly deflect the very strong estuary ebb/flood flows offshore to prevent the undermining of revetment. The mean range of tide is about 6.8 ft at Point Chehalis.

(NOAA Nautical Chart No. 18502)

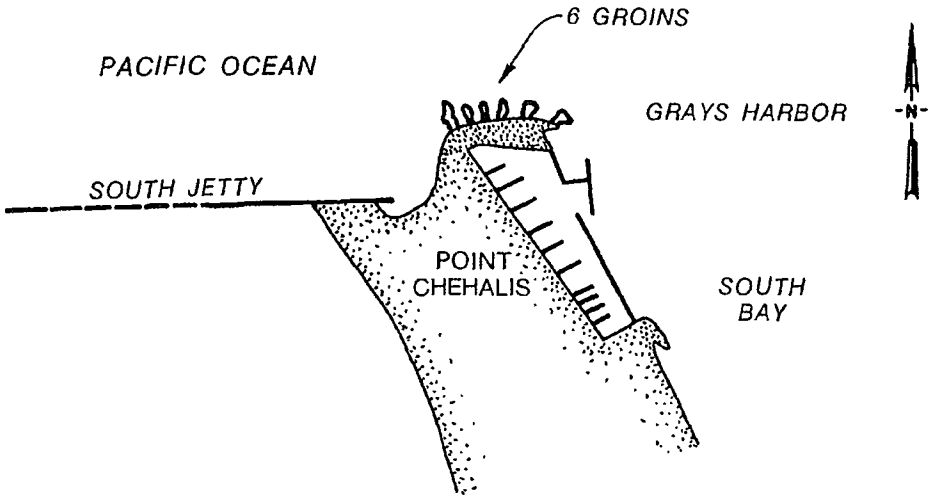


Figure 106. Groins at Point Chehalis

North Pacific Division

Alaska District

124. The Alaska District lists only a few estuarine training structures within the District's jurisdiction (US Army Engineer District, Alaska, 1985): a rock sill and dikes in association with breakwaters. The approximate location of the projects is indicated in Figure 107.

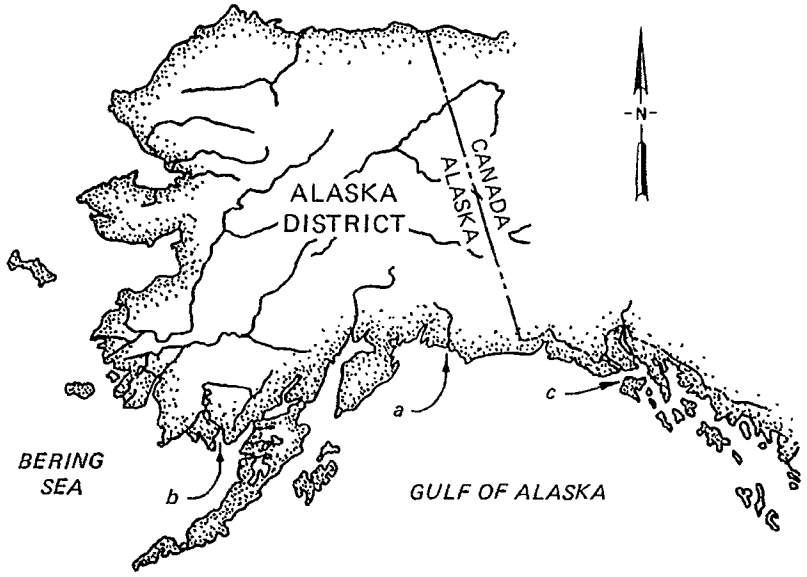


Figure 107. Location Plan 16, Alaska District

Cordova Harbor, Alaska

125. Site 16a, silt barrier (barrier dike). The project, located in Orca Inlet, includes breakwaters protecting the harbor (Figure 108). The "silt barrier" is apparently a type of geotextile cloth or other material, and provides the closing link of the harbor area.

(NOAA Nautical Chart No. 16700)

Dillingham Harbor, Alaska

126. Site 16b, submerged rock sill (barrier dike). The navigation project is located at the entrance of Scandinavian Creek to Bristol Bay (Figure 109). Construction of a rock sill and adjacent scour protection blankets was begun in 1961. The sill was damaged during the winter but was restored

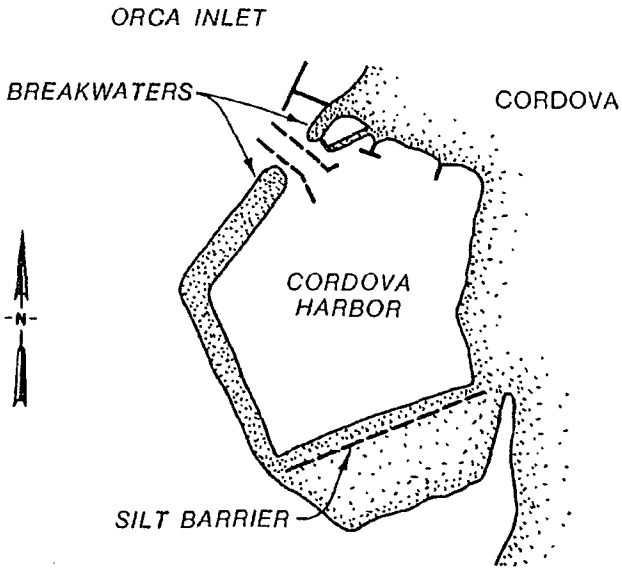


Figure 108. Silt barrier breakwater in Cordova Harbor

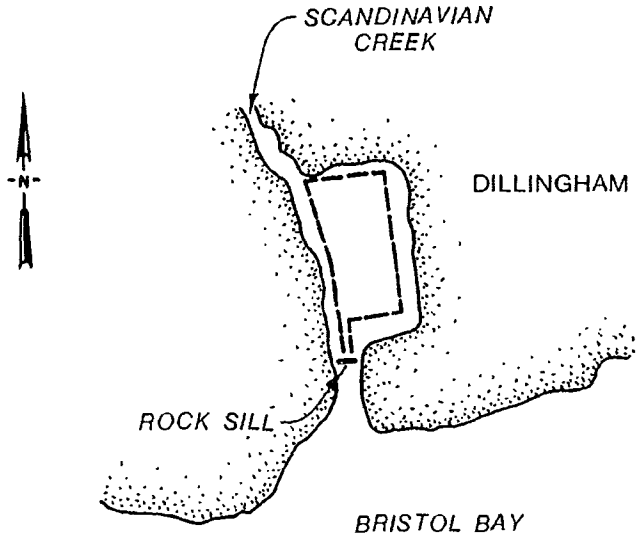


Figure 109. Rock sill in Dillingham Harbor

and completed in 1962. The mean range of tide is 15.9 ft.

(NOAA Nautical Chart No. 16322)

Hoonah Harbor, Alaska

127. Site 16c, diversion dike (lateral dike). The project is located

in Port Frederick on Chichagof Island, southeast Alaska (Figure 110). The harbor is protected by three rubble-mound breakwaters and two rubble-mound diversion dikes. The dikes, 800 and 1,165 ft long, were completed in 1980 and connect to the west breakwater southeast of Pitt Island. The mean range of tide is 12.4 ft.

(NOAA Nautical Chart No. 17316)

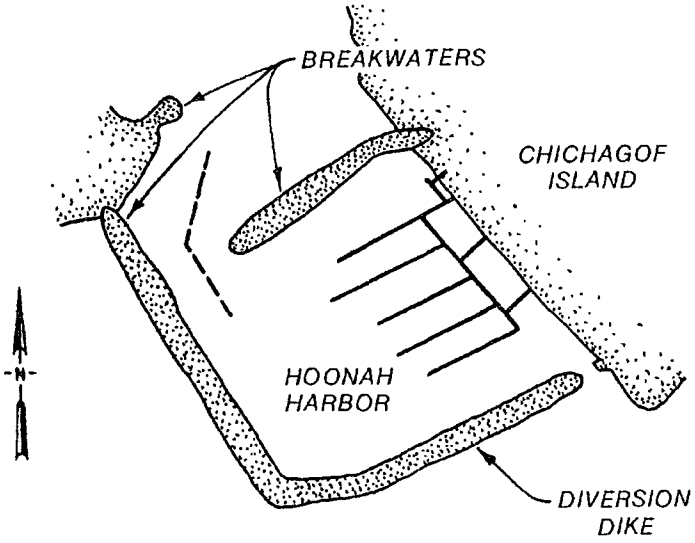


Figure 110. Diversion dikes in Hoonah Harbor

PART IV: SUMMARY

128. The preceding inventory of estuarine training structures was generated by a limited literature search of project maps of the Corps of Engineer Districts. This information provides the foundation for a data base concerning these structures. Since detailed training structure information is generally not contained in the project maps, a statistical analysis at this time would have little meaning. After additional data are obtained in the succeeding phases of the research, a breakdown of structures will be presented by type, material, location, etc.

129. At this time, however, it is known that there are over 554 training structures located in estuaries, of which there are at least:

a. 389 lateral dikes.*

b. 79 longitudinal dikes.*

c. 77 jetties.

d. 15 barrier dikes.

* The project maps indicated type and/or locations of contraction works without a specific number of structures.

REFERENCES

US Army Engineer District, Alaska. 1985 (Sep). "Project and Index - Rivers and Harbors, Navigation and Flood Control, Alaska District," Anchorage, Alaska.

US Army Engineer District, Baltimore. 1979 (Sep). "River and Harbor - Project Maps," Baltimore, Md.

US Army Engineer District, Charleston. 1976 (Sep). "Project Maps, Charleston District," Charleston, S. C.

US Army Engineer District, Galveston. 1977 (Sep). "Project Maps," Galveston, Tex.

US Army Engineer District, Jacksonville. 1979 (Sep). "Project Maps, 1979," Jacksonville, Fla.

US Army Engineer District, Mobile. 1982 (Sep). "Project Maps," Mobile, Ala.

US Army Engineer District, New Orleans. 1982 (Sep). "Project Maps - Rivers and Harbors, Flood Control Projects, Flood Control MR & T," New Orleans, La.

US Army Engineer District, New York. 1975 (Sep). "New York District, Project Maps, River and Harbor," New York, N. Y.

US Army Engineer District, Norfolk. 1984 (Sep). "Norfolk District, Project Maps," Norfolk, Va.

US Army Engineer District, Philadelphia. 1979 (Sep). "Project and Index Maps," Philadelphia, Pa.

US Army Engineer District, Portland. 1973 (Sep). "Project and Index Maps - River and Harbor and Flood Control," Portland, Oreg.

US Army Engineer District, San Francisco. 1984 (Sep). "Project and Index Maps," San Francisco, Calif.

US Army Engineer District, Savannah. 1985 (Sep). "Project Maps - River and Harbor, Flood Control and Beach Erosion Control Projects," Savannah, Ga.

US Army Engineer District, Seattle. 1982 (Sep). "Project and Index Maps - River and Harbor and Flood Control," Seattle, Wash.

US Army Engineer District, Wilmington. 1981 (Sep). "Project Maps, FY-83," Wilmington, N. C.

US Army Engineer Division, New England. 1980 (Sep). "Project Maps; Volume 2 of 3, Rivers and Harbors, Massachusetts," and "Project Maps; Volume 3 of 3, Rivers and Harbors, Rhode Island and Connecticut," Waltham, Mass.

_____. 1982 (Sep). "Project Maps - Rivers and Harbors; Volume 1 of 3, Maine and New Hampshire," Waltham, Mass.

Exhibit V

REMIS IMPROVEMENT RECORD UPDATE - RD5

SmartPath: LOV GO

REMIS MAIN | REAL Property | Acquisition | Management | Disposal Go to...

User Id: E3REMCEG Home District: NAN July 1, 2014 1:49:34 PM

Cost Project Task Work Item Component Forecasting Betterment Restrictions

Page 1 Page 2 Property Linkage Remarks

Save Revert Create New Query Copy Record

DISTRICT:	NAN
*RP Unique ID:	CHCKCH-3526
PROJECT/INSTALL CODE:	CHCKCH
PROJECT NAME:	CHEESEQUAKE CREEK CHANNEL IMP
STRUCTURE NO:	1
*Installation Identifier:	E3-0096-CHCKCH
WORK ITEM:	1004KY LOV
Work Item Name:	2 STONE JETTIES AND SHEET PILE DIKE
Task Code:	LOV
Task Name:	
Structure Type:	2 STONE JETTIES AND SHEET PILE DIKE
*REAL PROPERTY TYPE:	40 STRUCTURE
*REAL PROPERTY USE:	18 LOV
Use Description:	FLOOD CONTROL AND NAVIGATION
Item Description:	LOV
Constructed Date:	30-JUN-1953
APPROPRIATION TYPE:	C CIVIL
Reimbursable Funds:	
Location:	CREEK TO RARITAN BAY
Acquired Date:	
Inspection Date:	30-MAR-1995
CEFMS Current Cost:	40000
PROPERTY TYPE:	G Government Asset
CEFMS Phase:	S IN SERVICE
CEFMS Purpose Code:	
Place in Service Date:	30-JUN-1953
AMSCO Code:	C-657
Paid to Owner Cost:	.00
COST SHARE IND:	No
LIFE TYPE IND:	P Permanent
Betterment?:	No
Component?:	No
Disposed Ind:	No
Disposal Date:	
*LEGAL INTEREST:	

	G Federal Government Owned Property
*Lease Authority:	
*STATUS INDICATOR:	A Active
*Report of Excess Submitted Date:	
*Report of Excess Accepted Date:	
*Determination to Dispose Date:	
SIZE(QTY):	1.00
UOM:	EA
*BLDG UTILIZATION CODE:	
*Outgranted/Outleased?:	No
*Historical Status:	Not Evaluated
*REPORTING AGENCY:	9600 LOV
*USING ORGANIZATION:	9600 LOV
Occupied Square Feet:	
Occupied Months:	
*BLDG UTILIZATION :	% (Valid for REAL PROPERTY USE 10, 21, 30, 31, 41, 74)
*RESTRICTIONS:	NRES, WATR
*Replacement Value:	545933.89
$Repair Needs:	2670000
$Repair Needs Source:	Comparable Work
$Repair Needs Remarks:	PREPARED BUDGETARY ESTIMATE BASED ON LINE ITEM TASK IDENTIFIED IN 1995. ADDED 10% CONSTRUCTION CONTINENCY AND 10% COST FOR E & D.
*CONDITION INDEX:	0 %
*Sustainability:	
*Annual Operating Costs:	11437.13
Description:	
*MISSION DEPENDENCY:	Mission Critical
FEATURE CODE:	10 BREAKWATERS AND SEAWALLS
*GEOGRAPHIC STATE NAME:	NJ LOV
Fem Class Id:	LOV
*GEOGRAPHIC COUNTY NAME:	MIDDLESEX LOV
*Street Address:	
*GEOGRAPHIC CITY NAME:	LAURENCE HARBOR LOV
*GEOGRAPHIC COUNTRY NAME:	UNITED STATES LOV
*CONGRESSIONAL_DISTRICT (S):	01
*GEOGRAPHIC ZIP 1:	08879 LOV
Geographic Zip 2:	
*Latitude:	40.46286

*Longitude:	-74.25878
Condition:	GOOD

Save Revert Create

New Query

Exhibit W

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SITE REMEDIATION PROGRAM
Mail Code 401-06
P. O. Box 420
Trenton, New Jersey 08625-0420
Tel. #: 609-292-1250
Fax. #: 609-777-1914

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

May 8, 2013

Mr. Walter Mugdan, Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
Region II
290 Broadway
New York, NY 10007-1866

Re: Raritan Bay Slag Superfund Site
Record of Decision
CERCLIS ID NJN000206276
DEP PI#514709

Dear Mr. Mugdan:

The New Jersey Department of Environmental Protection (DEP) completed its review of the "Record of Decision, Raritan Bay Slag Site, Old Bridge/Sayreville, New Jersey" prepared by the U.S. Environmental Protection Agency (EPA) Region II in May 2013 and concurs with the selected remedy to address lead slag contamination in soil and sediment along the Raritan Bay waterfront.

DEP supports excavation, dredging and off-site removal of lead-contaminated soils and sediments under the selected remedy estimated at $78.7 million. Limited surface water monitoring is included in the plan to be conducted post removal to confirm all waste sources have been removed.

The selected remedy is noteworthy because it is an unrestrictive cleanup and there are no institutional controls required. Furthermore, the Remedial Investigation was completed within three years of listing on the National Priorities List of Superfund sites. DEP's early site investigation work for an Old Bridge open space proposal led to the discovery of the placement of slag and battery casings at the site. As was later confirmed by EPA's removal and remedial branches, this past waste disposal activity resulted in contaminated slag, battery casing and associated wastes impacting soils and sediments in the Cheesequake jetty, Laurence Harbor seawall and Margaret's Creek wetlands.

The selected remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on the Administrative Record file for this site. The response action selected in this Record of Decision is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

The components of the Selected Remedy include:

1. Remediation of Slag, Battery Casing/Associated Wastes: Slag, battery casing/associated wastes will be excavated based on visual observation and disposed of at appropriate off-site facilities. Slag materials that are not readily visible will be remediated as soil/sediment.

2. Surface Water: The approach to remediating the surface water contamination at the site is to remove the principal threat wastes that act as sources of contamination to the surface water. This will reduce the surface water contamination over time to acceptable levels. Monitoring will be implemented to assess the effectiveness of the remedy.

3. Soil and Sediments: Contaminated soils and sediment above the lead remediation cleanup level of 400 mg/kg would be excavated and/or dredged and disposed of at appropriate off-site facilities.

DEP appreciates the opportunity to participate in the decision making process to select an appropriate remedy and is looking forward to future cooperation with EPA in remedial action at this site.

If you have any questions, please call me at 609-292-1250.

Sincerely,

Dave Sweeney
Assistant Commissioner
Site Remediation Program

C: Ken Kloo, Director, Division of Remediation Management, DEP
Ed Putnam, Assistant Director, Publicly Funded Response Element, DEP
Carole Petersen, Chief, New Jersey Remediation Branch, EPA Region II